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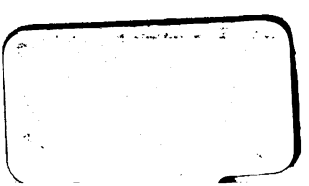

TRAVELS

FROM

BUENOS AYRES,

BY POTOSI,

TO

L I M A.

WITH NOTES BY THE TRANSLATOR,

CONTAINING

TOPOGRAPHICAL DESCRIPTIONS OF THE SPANISH POSSESSIONS IN SOUTH AMERICA,

Drawn from the Last and Best Authorities.

BY

ANTHONY ZACHARIAH HELMS,

FORMERLY DIRECTOR OF THE MINES NEAR CRACOW IN POLAND, AND LATE DIRECTOR OF THE MINES AND OF THE PROCESS OF AMALGAMATION IN PERU.

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INTRODUCTION.

THE improvement which M. de Born of Vienna had introduced into metallurgy, by his new method of amalgamation, attracted in the year 1787 the attention of the court of Spain, in whose American provinces they had, from the scarcity of wood, been obliged to have recourse to a rude kind of amalgamation for separating and purifying the nobler metals.

M. d'Elhuzar, director-general of the Mexican mines, whose works prove him to be an intelligent mineralogist, was accordingly sent to Hungary to make himself master of Born's method of amalgamation, and to engage expert German miners in the Spanish service, for the purpose of restoring, with their assistance, the American gold and silver mines to their former flourishing state. M. Helms, then chief assayer of the mines and mint at Cracow, and the Baron von Nordenflycht, a Swedish mineralogist, director of the mines at Miczanagora, in the district of Cracow, entered on the most advantageous terms into the Spanish service; the former as director of the smelting-houses and of the process of amalgamation, and the latter as director-general of the mines in Peru.

Accompanied by their families, a few negro servants, and a great number of German miners, they sailed from Cadiz for Buenos Ayres; and on the 29th of October, in 1789, the spring season in that part of the globe, began their journey at first in carriages, and afterwards on horseback, by the common route of the post, in an oblique direction across South America, through Tucuman and over the Cordilleras, to Potosi and Lima; an extent of way amounting, from Buenos Ayres to Potosi, to 1700 miles, and from thence, through Cusco and Guancavelica, to 1300 miles.

In Potosi the German commissioners remained until the 30th of January 1791, and during their residence endeavoured to dispel the incredible barbarism and ignorance that prevailed in the mint and mining departments there. Helms, for his part, erected a laboratory, in which he daily read lectures, accompanied with suitable experiments, to an audience composed of officers of the mint and proprietors of the mines; and fully instructed six young men in the science of metallurgy. Supported by the governor, he succeeded in exposing the ignorance of the American overseers and officers of the mines and mint; although the latter counteracted with all their might the royal commissioners, and particularly Helms, by secret cabals and the basest calumnies. In writing and in conversation they decried the Germans as arch-heretics, German Jews, and cheats; as men, in short, who, it was to be feared, would corrupt the morals of the honest miners and their overseers; and tried every means

to render them suspicious to the proprietors of the mines, fearing lest, enlightened by Helms and his associates, they should examine too narrowly into the conduct of their ignorant and roguish servants.

They even excited the Indian labourers against them, by insinuating that the foreigners had come solely for the purpose of working the mines by machinery, and would thus deprive them of the means of subsistence. In this opposition they were encouraged and joined by a numerous band of merchants in the principal cities; as Helms, in particular, spoke loudly against the enormous usury by which they oppressed the workers of the mines, and made every effort to put a stop to their rapacity.

Scarcely had Helms arrived in Lima, when, at the desire of the intendant of Guancavelica, he was ordered to proceed to that celebrated quicksilver-mine, to introduce there the Idrian furnaces. But in procuring Helms this commission, the intendant, an old creole, who by pretended patriotic projects had amassed a fortune of a million of piastres, had no other end in view but to derive a profit from furnishing the necessary building-materials, for which he received more than four times their value: and when Helms set his face against his nefarious proceedings, he had the address surreptitiously to procure an order from the viceroy to suspend the work. Vexation at the unjust treatment he here met with, threw Helms into a fever, which caused him to leave Guancavelica.

Two other commissions which he received from Lima to introduce a better method of working the

mines at Pasco and Bellavista, fifty miles from Lima, proved equally fruitless; as the viceroy absolutely refused any pecuniary assistance from the funds appropriated to the promotion of the mines, and would not permit him to raise the necessary supplies by means of a loan. All he could obtain was a commendatory epistle in praise of his zeal.

He therefore resolved to leave Peru, a land morally and physically pernicious to him—where, in the execution of the most dangerous and laborious commissions, he was obliged to act, not only as a director of the smelting-houses, but likewise as a carpenter, smith, and mason. Accordingly, in the beginning of the year 1793, he sailed from Callao, the port of Lima, on board of a register-ship; and after a passage of two months and a half, round Cape Horn, safely arrived in Cadiz. Having been obliged to spend seven months in Madrid in tedious solicitations to have the terms of his agreement fulfilled, he at last obtained a small pension for life, on which he lived lately at Vienna.

In 1798 M. Helms published an account of his travels, which is in the proper sense of the word a *Journal:* every page containing, unaltered, the remarks made and written down on the spot.

Station after station, the number of miles daily travelled and indicated; and interspersed we find remarks on what he every day had seen, and likewise extracts from the official details on the state of the mines which he had examined.

M. Helms is, however, only a miner and mineralogist. To the other parts of natural history he is a

stranger, and few things worthy of notice relative to that science are to be found in his journal. Even geographical and statistical observations occur only occasionally: but among them are many which contain valuable information, and which throw considerable light on the present state of these remote regions, with which we are yet but imperfectly acquainted.

Mineralogical and metallurgic remarks on Potosi and Peru, and on the Cordilleras, the largest and richest chain of mountains in the world, which Helms had travelled over in every direction in length and breadth, from the borders of Chili to Lima, form the bulk of his work. As few, however, would have the patience to peruse the whole of his dry mineralogical day-book, the unimportant details and repetitions relative to the contents of the mountains over which he travelled, have been abridged by the translator; at the same time that nothing useful has been omitted, and every fact relative to the general state of the country, or of the people, has been scrupulously retained.

It is to be regretted that these facts are not more numerous; but, as far as they go, their authenticity cannot be questioned; and as the last, and almost the only account of these countries, the work cannot fail to be acceptable to the public at a moment when the attention of all England has been excited towards them by the recent important conquest made by Sir Home Popham, and by the pending expedition of General Miranda. The travels of Ulloa in certain parts of this immense continent, it will be

recollected, were performed nearly seventy years ago, and perhaps no country in the world has undergone greater changes in the same interval of time, than South America.

The APPENDIX has been compiled from the best and latest authorities, and from scarce and expensive books, by the translator; and he may, without vanity, assert that it contains the fullest and the most correct account of Spanish America, which exists in any European language. He is indebted for many of his most curious facts to the valuable work on the present state of Peru, lately published by Mr. Skinner; and in defining the boundaries of the various governments, he is indebted to Mr. Arrowsmith, the geographer, for the use of the great Spanish map of South America. The work of Don Ulloa has been duly compared with later authorities; and the *Dictionario Geographico,* published by Don Alcedo, at Madrid, in 1788, a work till now wholly unknown to the English reader, has been carefully consulted. The detailed travels of Humboldt, it is well known, are not yet given to the world; but the various reports which have been published of them in his letters to his friends, have served to correct many errors, and to verify many facts in the existing accounts of those parts of South America over which he travelled.

TRAVELS

FROM

BUENOS AYRES

TO

LIMA.

ON the 29th of October 1789, we began our journey from BUENOS AYRES westward to Cannada de Maron; distant fifteen geographical miles, reckoning sixty to a degree. Buenos Ayres is situated on the south-west bank of the great river la Plata; and, according to the account which he received from the viceroy, contains from twenty-four to thirty thousand inhabitants. In 1748, regular posts were instituted from hence to Peru; post-houses were erected, and relays of horses and carriages provided*.

Seventy-three miles from the capital the traveller enters on an immense plain, by the Spaniards called Pampas, which stretches three hundred miles westward to the foot of the mountains, and about fifteen hundred miles southward towards Patagonia†. This plain is fertile, and wholly covered with very high grass; but for the most part uninhabited and destitute of trees. It is

* For full local descriptions and other particulars, see the notes in the Appendix.

† In crossing South America from Buenos Ayres to Peru, great danger arises from the savage nations who inhabit these pampas. Troops of them attack travellers; but they do not possess valour sufficient to maintain a combat, and their attacks are successful only when made by surprise, or when greatly superior in numbers.

The abundance of the necessaries of life encourages, among the lower orders, a propensity to idleness, which has given rise to another order of strollers, called *Gauderois*. Their mode of life resembles that of the *Gypsies*. They are badly clothed; their whole dress consisting only of a coarse shirt, and a worse upper garment. These articles of dress, together with horse furniture, serve them for bedding, and a saddle for a pillow. They stroll about with a kind of small guitars, to the sound of which they sing ballads.

the abode of innumerable herds of wild horses, oxen, ostriches, &c. which, under the shade of the grass, find protection from the intolerable heat of the sun. The largest tamed ox is sold for one piastre*, and a good horse may be purchased for two.

From Cannada de Moron to Cannada de Escobar, twenty-one geopraphical miles.

On the 29th of October we were obliged to encamp at night during a heavy storm; and early on the 30th of October we arrived at Escobar.

From Cannada de Escobar to Cannada de la Cruz, twenty-four miles.

At the former of these places I saw in the evening so great a number of luminous insects, that at first I mistook them for exhalations proceeding from the marshy ground; but found that they were a kind of glow-worms, twice as large as those of Europe. They are of an oblong shape, and of a brown colour.

From Cannada de la Cruz to Arcos, eighteen miles.

Adjoining to the post-house at Arcos, I found a beautiful orchard planted with peach-trees.

From Arcos to Chacras de Ayola, twelve miles.

The magnetical needle here points exactly north.

From Chacras de Ayola to Arecive, thirty miles.

On the road between these two stations, two of our *carretillas*, or baggage-waggons, broke down. The post-house here is tolerably commodious. Near it are orchards of peach-trees, which are the only trees that grow in the pampas.

From Arecive to Pontezuelos, twelve miles.

From Pontezuelos to Arroyo de Ramallo, eighteen miles.

From Arroyo de Ramallo to Arroyo de Elmedio, fifteen miles.

From Arroyo de Elmedio to Arroyo de Pabon, fifteen miles.

From Arroyo de Pabon to Manauciales, ten miles.

As we pursued our journey late in the evening, we saw large flocks of ostriches (*Struthio Rhea* Linn.), which had come forth from the long grass to refresh themselves with water. On the following day some of our attendants rode a considerable way into the grass, and brought back about fifty eggs of these birds. The heat of the sun being very great, and each of us having put some of them into his hat, the young birds, to our no small astonishment, broke the shell and ran away into the grass, which they began to devour with as much appetite as if they had been long accustomed to such a diet. The eggs are as large as an infant's

* The piastre is 3s. 7d. English, being rather more than six to a guinea. *See Appendix.*

head of a moderate size, and the young ostriches, when hatched, are of the size of a chicken two months old.

The ostriches lay their eggs, either singly or twenty together, in nests*; and it is propable that in the day-time they leave them exposed to the rays of the sun, and sit on them only during night to protect them from the effects of the dew.

The ostriches that inhabit the pampas are of the height of a calf. Though from the shortness of their wings they are unable to fly, they run faster than the fleetest horse.

From Manantiales to Demochados, thirty miles.

From Demochados to Esquina de la Guardia, twenty-four miles.

Here there is a square fortification, mounted with two pieces of cannon, for the purpose of checking the incursions of the wild Indians, who are said sometimes to attack the weak Spanish villages in bodies of from two to three thousand men. From the testimony of the inhabitants, however, it would appear that the danger is not so great as the Spanish soldiers (*milizianos*) stationed there endeavour to persuade strangers from Europe, for the purpose of giving them a high opinion of their courage and valour, of which they are suspected to possess but a small share. In this fortification there should be a guard of a captain and thirty men; but in the day-time we did not find a single sentinel. These soldiers are badly armed; some with firelocks, others with pistols, and others only with sabres or spears. As the wild Indians still retain a dread of all European weapons, and especially of fire-arms, we see no reason to reckon it a deed of uncommon heroism, if these thirty horsemen sometimes put to flight two or three thousand savages, whose weapons consist only of a sling or a rope six ells in length, with an angular stone or a piece of lead fastened to the end of it, with which they endeavour to give their enemy a blow from behind; and they are in general so expert in its use, and have such command of their horses, that they seldom miss the object aimed at.

The wild Indians have no intercourse with the civilized Indians or the Spaniards, whom they mortally hate, and are in the highest degree dirty, savage, mistrustful, and treacherous; they are strong and enterprising, but easily dismayed on the near approach of danger.

Their vices show the state of society among them to be the natural consequence of the manner in which they are treated by the Spaniards: for if the latter were more attentive to the general good of the state, and less attached to the promotion of their

* According to Molina, even from forty to sixty in one nest. See *Saggio sulla Storia Naturale del Chili.* Bologna, 1782, p. 262.

private interests, it would be easy, by mildness and by opening a free trade with them, gradually to render them, in the same manner as the civilized Indians, useful subjects of the crown. But this can be effected only by statesmen of enlarged minds, and gifted with sound political knowledge:—such may possibly exist in Spain, but are seldom met with in South America.

From Esquina de la Guardia to Cabeza del Tiguere, twenty-one miles.

Cabeza del Tiguere lies on the Rio Tercera: the bed of this river consists of decomposed granite.

From Cabeza del Tiguere to Saladillo, twenty-four miles.

Most of the undulatory heights in this neighbourhood were wholly covered with native saltpetre, as if with a hoar-frost.

From Saladillo to Barrancas, nine miles.

From Barrancas to Zarjon, twelve miles.

The bed of the river here consisted of indurated marl, intermixed with calcareous shells.

From Zarjon to Frailem Muerto, twelve miles.

Here begins a wood which continues on a gentle ascent as far as Cordova. In this wood were only found two kinds of trees; they resemble the olive of Spain, but bear no fruit; their leaves are of a most beautiful green colour.

From Frailem Muerto to Esquino de Medrano, eighteen miles.

Here the post-house and some huts of creoles are situated in an open field, without any ditches or ramparts, because the savage Indians never extend their predatory incursions thus far.

From Esquina de la Guardia to Paso Ferreira, eighteen miles.

From Paso Ferreira to lo Tio Pafio, twelve miles.

Thence to Cannada del Govierno.

Thence to Impira.

We still continued to proceed in a north-west direction, along the river Tercero.

From Impira to Rio Segundo, situated on a river of the same name, fifteen miles.

The river Segundo is a continuation of the river Tercero, receiving its waters from the Peruvian promontory which begins near this place.

From Rio Segundo to Punto del Monte, thirteen miles and a half.

From Buenos Ayres, the capital, to Cordova is four hundred and sixty-eight miles.

Cordova, a neat clean town, is very pleasantly situated near a wood at the foot of a branch of the Andes. It is the seat of a

bishop, and is inhabited by 1500 Spaniards and Creoles, and 4000 Negro slaves.

A transit trade is carried on here from Buenos Ayres to Potosi. The cathedral is a very fine edifice, and the spacious market-place is adorned with buildings of considerable magnitude; the streets are likewise much cleaner than in Buenos Ayres, being paved, an improvement still wanting in the capital. We were pleasantly lodged in the late college of the Jesuits. It is a very large and massy edifice, and the usual residence of the bishop. But the see was now vacant. The heat is more intense here than at Buenos Ayres, which, from its situation on the larger river la Plata, and its vicinity to the sea, enjoys a milder temperature.

Not far from the town, in the granite mountains, are found veins of lead and copper ore which contain silver. As this ridge of mountains (composed of red and green granite) gradually becomes higher, the population increases: but at Remanso, 60 miles from Cordova, they again branch out so far from one another, that from that place to Tucuuum the traveller passes through a saline plain 210 miles in length, and for the most part barren and desert, from which the mountains are seen at a distance. The whole ground is covered with a white incrustation of salt, and bears no other plants except the *salsola hali*, which here grows to the height of four yards. The decayed little town of St. Jago de Estero, is situated in this plain.

The creole, a descendant of American Spaniards, is of a brown complexion, and differs in every respect from his ancestors. Though born with a genius capable of attaining whatever ennobles humanity; yet, from an education in the highest degree neglected, he becomes lazy, licentious, and indelicate in his conversation; a hypocrite, and infected with a blind and malignant fanaticism. He tyrannizes over his slaves; but, in general, through his inordinate love of pleasure, is himself enslaved by his mulatto and black females, who rule him with despotic sway. He is in the highest degree reserved and insidious; the sport of every unruly passion, immoderately puffed up with pride, and prepossessed against whatever is European; and, in an especial manner, of a hostile and mistrustful disposition towards the Spaniards. Under the oppressive yoke of such men the Indians have lived for centuries, and they consequently pant for the blessings of liberty.

The king of Spain has enacted several salutary laws, with a view of ameliorating the condition of the Indians; but they have either never been promulgated, or, by intrigues or artifice, are soon rendered of no avail.

The Indians are, in fact, the only industrious class of the community. To the labour of these patient drudges we are indebted for all the gold and silver brought from every part of Spanish America. No European, nor even the Negroes, are robust enough, for one year only, to resist the effects of the climate, and support the fatigues of working the mines, in the mountainous regions. Yet to these good and patient subjects their haughty masters leave, as the reward of their toil, scarcely a sufficient pittance to enable them to procure a scanty meal of potatoes and maize boiled in water.

The following list of the mines or pits, in the viceroyalty of la Plata, or Buenos Ayres, was extracted from the records of the chancery.

Names of the Provinces.	Gold Mines.	Silver Mines.	Copper Mines.	Tin Mines.	Lead Mines.
Tucuman	2	1	2	—	2
Mendoza a Chili	—	1	—	—	—
Atacama	2	2	1	—	1
Lipez } province of Potosi {	2	1	1	—	1
Porco } province of Potosi {	1	2	1	—	—
Caranges	—	2	1	—	—
Pacages or Berenguela	—	1	—	—	—
Chucuyto	—	2	—	—	—
Paucarcolla, city of Puno	—	1	—	—	—
Lampa	—	2	—	—	—
Montevideo	1	—	—	—	—
Chicas or Tarifa	4	5	—	—	1
Cochabamba	1	—	—	—	—
Zicazica	2	—	—	—	—
Lavicaja	4	—	—	—	—
Omasuijos	4	—	—	—	—
Avangaro	3	—	—	—	—
Carabaya	2	1	—	—	—
Potosi	—	1	—	—	—
Chayanza	2	3	1	1	1
Mizque	—	1	—	—	—
Paria	—	1	—	1	1

In the neighbourhood of Cordova there is a great scarcity of water for the mines and the purifying of the ores.

From Cordova, we pursued our journey northward, along the foot of the anterior ridge of the Andes, to Noria, twenty-one miles.

From Noria to Sinsacate, fifteen miles.

From Sinsacate to Totoral, eighteen miles.

From Totoral to San Antonio, fifteen miles.

From San Antonio to Coral de Baranca, fifteen miles.

The direction of that ridge of mountains is from south to north, and it here begins to rise gradually to a considerable height. In the valleys I first saw the American palm, which forms one of their chief ornaments.

From Coral de Baranca to San Pedro, twelve miles.

From San Pedro to Durazno, twelve miles.

The mountains continue to be composed of red and green granite, and contain veins of corneous silver ore.

From Durazno, we passed through a broad and pleasing valley to Channar ó Cachi, fifteen miles.

From Channar to Pontezuelo, twenty-seven miles.

From Pontezuelo to Remanso, twenty-four miles.

From Remanso to Yuncha, ninety miles.

From Yuncha to Silipica, thirty-three miles.

From Silipica to San Jago de Estero, thirty-three miles.

San Jago, situated on the river of the same name, is a small town, which has fallen into decay, in consequence of the trade which it once enjoyed having been diverted into other channels.

From the great declivity and depth of the valleys of San Jago the heat is almost intolerable, especially when the wind blows from the north.

From San Jago de Estero to San Antonio, eighteen miles.

From San Antonio to Chachilla, twenty-four miles.

From Chachilla to Vinara, twenty-four miles; and during fifteen miles of our route we passed and repassed the river St. Jago in all directions. In January, however, when the snow begins to melt on the mountains of Potosi, this river swells so as to become dangerous to travellers.

From Vinnara to Palmas, eighteen miles.

From Palmas to Talacacha, eighteen miles.

From Talacacha to Tucuman, twenty-four miles.

Tucuman, a pleasant little town, which is surrounded by groves of citron, orange, fig, and pomegranate trees, lies four hundred and fifty miles from Cordova, and seven hundred from Potosi. It is the seat of a bishop, and contains three monasteries: the inhabitants are wealthy, and might derive great profits from working gold and silver mines; as, immediately after passing this place, the whole ridge of mountains contain the precious metals in abundance. But the Negro slaves, who are here employed in mining, and their overseers are so ignorant, that they have not even an idea of the advantages arising from the use of a windlass, and carry out the ore in sacks upon their shoulders: and this we found in the sequel to be the practice at Potosi, and in the whole kingdom of Peru.

During the journey to Tucuman, we found the mountains composed of primitive granite, but as we proceeded, the granite

became intermixed with argillaceous slate of various colours; that, however, which chiefly predominates in the Cordilleras, is of a bluish cast, as far at least as we had an opportunity of examining them. Strata of limestone, and large masses of ferruginous sandstone, are in many places superincumbent on the argillaceous slate. We likewise found on the road, coal, gypsum, and rock-salt; the last even on the summits of the most elevated ridges.

From Tucuman to Tapia, twenty-one miles.

From Tapia to Duralde, twenty-four miles.

Duralde is situated on a mountain torrent of the same name. On account of the badness of the road, we did not arrive here till late at night on the 14th of December.

From Duralde to Paso del Pescado, eighteen miles.

Twelve miles from Pescado lies Trinca, a small pleasant little town with a church, on a mountain torrent of the same name. The road continued to pass through thick woods, which, however, contain very few large trees.

From Paso del Pescado to Arenal, thirty-seven miles.

From Arenal to Rosario, fifteen miles.

From Rosario to Concha, twenty miles.

The main ridge of mountains begins to rise here considerably. In the bed of the river Rosario we found blue argillaceous slate, of which the mountains are chiefly composed. The woods are thicker, and the trees of a more vigorous growth.

From Concha to Rodeo de Tala, twenty-four miles.

From Rodeo de Tala to Pasage, on the river of the same name, twenty-four miles.

About seven miles from Tala we passed the dry bed of a river, the southern bank of which was incrusted with a white substance, in taste and shape resembling common culinary salt; and from various other indications, we were led to conclude that there are large beds of fossil salt in this part of the country.

From Pasage to Sienage, thirty miles.

From Sienage to Cobos, twenty-one miles.

From Cobos to Salta, twenty-seven miles.

The town of Salta is situated on the river Arias, in 64° 45′ of west longitude. It is divided into four principal streets, very irregular, but wider than those of Cordova. The market-place (*Plaza Major*) is a regular and large square, on the west side of which stands the beautiful town-house, and on the opposite side the cathedral. It is the residence of the governor-intendant, and of the administation of the province of Tucuman. Besides the cathedral, there are seven churches and monastic establishments. There are about 600 Spanish families here; and the whole population, including creoles and slaves, is estimated to

amount to 9000 souls. The inhabitants, who carry on a considerable transit trade with Potosi, Peru, and Chili, are richer and more polished than those of Cordova and Tucuman.

Here terminated the less elevated ridges and promontories: and we now prosecuted our journey over the Cordilleras, properly so called, which are rich in various plants, and whose snow-capt summits are lost in the clouds.

At Salta we changed our carriages for saddle mules, and thence pursued our way over the highest chain of mountains on the globe, and on roads the most wretched and fatiguing, eighteen hundred miles to Lima. It was fortunate for us that we had entered upon this dangerous journey at the most proper and favourable season of the year; as in our progress across the Cordilleras we were obliged to ford a number of rapid rivers and torrents (some of them even thirty different times). In these torrents, which often suddenly swell during summer, a great number of travellers perish. In a few hours we exchanged the very intense summer-heat in the valleys for the piercing cold of the snowy summit of the mountain—a transition that soon undermines the health of the most robust European. A hectic fever attacks him; or he is seized with the cramp, rheumatism, and nervous melancholy.

Immediately behind Salta, the woods which till then had covered the less elevated ridges, cease to embellish the landscape:——but the traveller is no longer incommoded by an almost incredible multitude of locusts, crickets, singing-toads, frogs, serpents, crocodiles, and musquitoes.

The ants are likewise very numerous and troublesome; their bite, and the corrosive fluid which they discharge when irritated, causing as painful symptoms as the sting of the musquito.

The ill regulated, dirty post-houses swarm with bugs, fleas, and other vermin; and we were frequently obliged to quench our thirst with nauseous fetid water, or to breathe air impregnated with the noxious effluvia of putrid carcases. But the inquisitive traveller, in the pursuit of knowledge, braves danger, fatigue, and privations of every kind, while his mind is gratified by the acquisition of new ideas, or the contemplation of the wonders of nature.

The tiger is the fiercest and most dangerous of all the beasts of prey found in this country. The South American lion, I was informed, far surpasses the tiger in strength and courage, though not larger than a middle-sized dog: in other respects, however, it perfectly resembles the African lion.

There are no domestic bees reared in hives in South America; and those which are wild do not construct their nests in the hollow trunks of trees, as in Europe, but fix them in a very cu-

rious manner on the branches. These nets form an oval ball of wax, about the size of an ox's bladder; at its apex is the opening through which the insect enters, and within are cells full of the purest honey. Owing to the heat of the climate, the inflammable parts of the external shell of wax gradually drip away, and only the earthy particles remain.

From Salta to Caldera, eighteen miles.

From Caldera to Buena Voluntad, seventeen miles.

From Buena Voluntad to Jujui, six miles and a half.

Jujui is a small town containing about three thousand inhabitants, who carry on some trade with Potosi; they might derive great advantage from the rich ores in the neighbourhood: but here, as well as at Tucuman and Salta, they have neither enterprise nor skill to make a proper use of the gifts which nature has bestowed with a liberal hand on these interesting regions.

From Jujui to Bolcan, twenty-seven miles.

The river Bolcan is the largest of the mountain torrents we passed since we left Jujui. The ascent became circuitous, and more gradual.

From Bolcan to Los Ormillos, twenty-seven miles.

From Los Ormillos to Guacatera, eighteen miles.

As hitherto we had passed over few mountains, and proceeded along the valleys, we crossed the Jujui no less than thirty times in one day; which a month later would have been attended with danger, as this rapid river is at that season much swollen with rain, and the melting of the snow on the mountains.

From Guacatera to Humaguaca, eighteen miles.

A mile from the village of Humaguaca, when we had almost reached the highest part of the mountains, I again met with indications of beds of salt.

Guacatera is a small Indian town, governed by an Indian judge or alcade. It has a church and a neat chapel on an adjoining hill.

The converted Indians, who are styled *Fideles*, in contradistinction to the savages, whom they call *Barbaros*, *Infideles*, or *Bravos*, are of a very obedient and patient disposition; but, from the abject state to which they are reduced, and the oppression of the sub-delegates, they are very timid and suspicious. If we may judge of their character from that of the wild Indians, it seems not improbable, that if they enjoyed a better education, and milder treatment, they would become one of the best nations on earth; for in their intercourse among themselves, they give strong proofs of humanity and a love of justice, and betray less selfishness and less pride than the Creoles; they also evince a quick sense of right and wrong. Their colour resembles dark bronze; they have an agreeable physiognomy, and

muscular limbs; they are of a middle stature, and endued with an excellent understanding, but are rather of a pensive and melancholy, than lively disposition. The Indians being esteemed the most laborious and diligent of the various classes of men found here, such as Spaniards, Creoles, Mulattoes, Samboes, Negroes, are employed through the greatest part of South America in mining, tending flocks, in cultivating the fields; and more especially as domestic servants; as in the mountains or mine country, the Negroes, like the Europeans, cannot endure the daily alternations of heat and cold; but become sickly, and soon die an untimely death.

From Humaguaca to Cueba, twenty-four miles.

From Cueba to Los Colorados, eighteen miles.

Mountains so irregular and broken as this part of the Cordilleras, and with such various alternations of their component parts, we had seen neither in Hungary, Saxony, nor in the Pyrenees. In no place does a revolution of nature appear to have been so general as in South America; of which the traces are every where discoverable.

One hundred and forty miles beyond Jujui, the traveller reaches the highest ridge of the Cordilleras; which is the favourite haunt of the celebrated sheep (named *Lama* or *Guanaco*, and by the Indians, *Huanacos*,) which feeds on moss, is easily tamed, and used as a beast of burthen. This animal, as likewise the *Vicunna*, is found only on the summits of hills covered with snow, and in the coldest mountainous regions, where they rove about in numerous herds.

I likewise saw here the American wild cat, which is not much larger than our domestic cats: its fur is excellent, and its flesh is esteemed a delicacy by the Creoles and Indians.

From Cangrejos to Guayaca, twenty-seven miles.

From Guayaca to Mojos, twenty-one miles.

The Indian town Mojos formerly belonged to Peru, and was the border-town towards the kingdom of La Plata, or Buenos Ayres. But in a recent division, the southern provinces of Peru, viz. Atacama, Potosi, Caranges, and others, have been added to the kingdom of La Plata, whose limits were extended four hundred and fifty miles further, to Santa Rosa. In the argillaceous-slaty mountains around Mojos, we found a great many veins of quartz, containing gold, yellow copper-ore, lead-ore, and iron-spath. The terminations of these veins appear above ground; but few of them are worked. There is likewise near that town a considerable stratum of magnetical iron-sand, full of particles of gold, some of which are as large as a quarter of a ducat: but of this gold the American gains but a small proportion, as he washes away into the stream all the finer par-

ticles, which are less than half the bigness of a lentil. Similar alluvial layers, containing gold, and resting on the base of argillaceous slate, occur till within a short distance of Potosi; and gold is washed from them, especially at the little town of St. Jago de Cotagoita, ninety miles from Mojos, and as many from Potosi.

From Mojos to Sulipacha, twenty-four miles.
From Sulipacha to Mojara, twenty-four miles.
From Mojara to Bamada, eighteen miles.
From Bamada to San Jago de Cotagoita, twenty-four miles.
From San Jago de Cotagoita to Escobar, twelve miles.
From Escobar to Guirbe, eighteen miles.
From Guirbe to Zurupalca, eighteen miles.

After passing a high mountain, we descended towards Rio Grande, a large mountain-torrent, which we were obliged to cross more than fifty times in one day.

From Zurupalca to Caiza, eighteen miles.

At Caiza, one hundred and forty-two miles from Potosi, are found, in a hot spring, impregnated with hepatic gas, small pieces of brimstone, and a friable clay full of crystals of allum; from which we may infer, that the water derives its peculiar properties from a stratum of burning sulphur in the aluminous slate, from which it bursts forth. There are similar hepatic springs twelve miles north of Potosi, and at Churin, one hundred and fourteen miles to the north-east of Lima.

From Caiza to Potosi, thirty-six miles.

This was the most fatiguing and disagreeable post during our whole journey; having been exposed till ten at night to heavy rain, and often obliged to wade knee-deep in the bed of the Rio Grande: and from the height of this tract of country, the air was most piercingly cold.

Here, on the highest plains, the water from the snowy summits of the mountain is collected, till forcing a passage through the clefts, and forming several cataracts, it flows into the Rio Grande.

Twelve miles from Potosi the ridge begins to decline to the north, so that a considerable river flows in that direction, while the Rio Grande runs towards the south.

It deserves to be remarked, with respect to the great chain of mountains stretching from Tucuman to Potosi, that till within eighteen miles of the latter place, where the Rio Grande takes its rise on the highest part of the mountain, the valleys in many places produce small trees and bushes; but further towards Potosi they are entirely destitute of wood; and on the high shelves and declivities nothing grows but patches of green spongy moss,

which serves for food to the lamas, as likewise to sheep, asses, and mules.

Brushwood and charcoal for fuel must therefore be brought from a distance of from thirty to sixty miles, and larger trees fit for building even from Tucuman, being dragged across the mountains by the hands of men.

A beam of timber sixteen inches square, and thirty-four feet in length, costs at Potosi two hundred pounds.

It in a particular manner excited my astonishment here to find the highest snow-capt mountains within nine miles from Potosi, covered with a pretty thick stratum of granitic stones, rounded by the action of water.

How could these masses of granite be deposited here, as there is a continual descent to Tucuman, where the granitic ridge ends, and from Tucuman to Potosi it consists of simple argillaceous schistus?

Have they been rolled hither by a general deluge, or some later partial revolution of nature?

The solution of this question I shall leave to systematic naturalists and geologists.

The celebrated city of Potosi is situated in the midst of the most elevated range of the Andes, whose summits, at the distance of nine miles to the south, are covered with snow. It contains about one hundred thousand inhabitants, including slaves. The churches are very rich in silver utensils, and the clergy are subject to the jurisdiction of the archbishop of Chuquisaca, which is the seat of the ecclesiastical tribunal for the whole kingdom of La Plata, and of an university. The militia consists of only five hundred men, of a most wretched appearance, without uniforms, and without cannon; and of whom one-half parade with wooden muskets.

The mountain Potosi, at whose foot the city is built, resembles a sugar-loaf; it is almost eighteen miles in circumference, and chiefly composed of a yellow very firm argillaceous slate, full of veins of ferruginous quartz, in which silver-ore and sometimes brittle vitreous ore are found interspersed.

These rude ores are there called *paco ores*; and from experiments with more than three hundred specimens, I found they contain, on an average, from six to eight ounces of silver in every *caxon*, or fifty hundred weight. They sometimes likewise meet with solid silver-ore, especially with grayish brown ore, each *caxon* of which yields twenty marks of silver. Above three hundred mines or pits are worked; but all of them irregularly, and as if it were merely for plunder: few of them therefore penetrate to a greater depth than about seventy yards.

A main conduit which had been begun in 1779, and in the

course of nine years had, at an incredible expence, been carried on two miles in length, was even at its mouth much too high, and yet had been made to slope one yard in every thirty-two; so that it could not come deep enough into many of the pits to free them from water.

The conduit intersects eight new lodes running in a direction nearly from north to south; the best of them is galena, about two feet deep, and was said to yield eight marks of silver in fifty hundred weight of ore. The rest consist of spathose blend, with gray silver ore and yellow copper ore.

On the opposite side we inspected another old conduit, which about a hundred years ago led to many rich veins of red and gray silver ore. But they had no proper machinery; the pits became filled with water: we found all along the bottom of the conduit good red and other silver ores, mixed with other materials, which by proper management might yield the proprietors a considerable quantity of metal: but it would be still more to their advantage if they employed skilful men to erect machinery for the purpose of clearing the bottom of the mines from water. The direction of this as well as the large conduit is nearly from east to west.

Still greater, if possible, was the ignorance of the directors of the smelting-houses and refining-works at Potosi: by their method of amalgamation they were scarcely able to gain two-thirds of the silver contained in the *paco-ore;* and for every mark of pure silver gained, destroyed one, and frequently two, marks of quicksilver. Indeed all the operations at the mines of Potosi, the stamping, sifting, washing, quickening, and roasting the ore, are conducted in so slovenly, wasteful, and unscientific a manner, that to compare the excellent method of amalgamation invented by Baron Born, and practised in Europe, with the barbarous process used by these Indians and Spaniards, would be an insult to the understanding of my readers.

The tools of the Indian miner are very badly contrived, and unwieldy. The hammer, which is a square piece of lead of twenty pounds weight, exhausts his strength; the iron, a foot and a half long, is a great deal too incommodious, and in some narrow places cannot be made use of. The thick tallow candles wound round with wool vitiate the air.

In the royal mint at Potosi, where from five hundred and fifty thousand to six hundred thousand marks of silver, and about two thousand marks of gold, are annually coined, affairs were not better conducted. Every hundred weight of refined copper, used for alloy in the gold and silver coin, cost the king 35*l.* through the gross ignorance of the overseers of the work, who spent a whole month in roasting and calcining it, and frequently

rendered it quite unfit for the purpose. I was therefore ordered by the governor, Don Fr. de Paulo Sanz, to introduce a process founded on sound principles.

For this perpose, as no chemico-metallurgic laboratory existed here, I erected one, with all the necessary apparatus, in one of the largest rooms of the mint, and in the presence of the governor and all the persons belonging to the mint-department, proved by experiment, that it might be brought to a greater degree of fineness in four hours and a half, and at less than one-twentieth part of the expence.

These various evils the German commissioners endeavoured as much as possible to remove. Mr. Weher, one of my colleagues, dug two deep conduits (to free the mines from water) in the mountain of Potosi; Baron von Nordenflycht erected proper machinery; amalgamation works, according to Baron Born's plan, were erected under my superintendence, and lessons in metallurgy were given by me to six pupils. As soon as the water in the pits can be got under, the mines of Potosi will be in a more flourishing condition than ever. However, the total want of timber on this naked ridge of mountains very much retards the work.

The revenue to the king from the mines in the kingdom of La Plata is said to amount annually to four millions and a half of piastres; and if they possessed more knowledge and economy, it might easily be doubled. If all the veins of ore, &c. were sought for, and wrought with but moderate skill and diligence, this kingdom alone might yield every year twenty, and even thirty, millions of piastres.

From Buenos Ayres to Potosi, one thousand six hundred and seventeen geogvaphical miles.

As Baron Nordenflycht was obliged to say some time longer at Potosi, to superintend the finishing of the machinery for the mines, I set out for Lima on the 30th of January, 1790, with the greater part of our German miners, and travelled to Jocalla, nine miles.

Twelve miles to the south of Potosi there is a hot sulphureous bath, with a boiling hot spring. Near it is a village, whither the invalid Potosians resort, for the recovery of their health. The waters possess the same qualities and virtues as the springs near Caiza.

Argillaceous slate is here, likewise, the chief component part of the mountain, with a stratum of sand-stone upon it.

Further on we again find on both sides alluvial hills, with rounded masses of granite, extremely bad roads, and the mountain very much weather-beaten and broken.

From Jocalla to La Lenna, eighteen miles.

Not far from Jocalla a mass of granite, many miles in length, rises in huge weather-beaten rocks, which threaten every moment to roll down the precipices. At Lenna the granite masses are succeeded by a stratum of deep red rough-grained sand-stone.

From La Lenna to Las Lagumillas, fifteen miles.

We now entered a valley, which, with little variation, extends above six hundred miles to Cusco.

From Tolapalca to Guilcapuzico, twelve miles.

Thence to Ancacato, fifteen miles.

Here again argillaceous slate, interspersed with masses of granite, appears.

From Ancacato to Las Pennas, twelve miles.

A layer of red sand-stone on the substratum of argillaceous slate. The soil becomes more fruitful, and population and the number of villages increase.

From Pennas to Condor-Apacheta, fifteen miles.

The sand-stone succeeded by argillaceous slate, mostly covered with thin moss.

From Condor-Apacheta to La Venta de en Medio, fifteen miles.

From La Venta de en Medio to Oruro, twenty-seven miles.

The valley becomes more even and agreeable.

Four miles from Oruro it is covered with a saline incrustation, mixed with saltpetre.

Oruro, a town in this valley, was formerly the residence of wealthy capitalists, who derived their riches from the mines in the adjacent ridge of mountains. But in the dreadful insurrection of the Christian Indians of La Plata and Peru, in the year 1779, here, as in most other towns of these extensive kingdoms, the greatest and richest part of the Spaniards were murdered, and the town plundered and almost totally destroyed. Those who escaped, and had concealed their money and valuable effects in the monasteries, mostly emigrated to Europe*. And hence the mines here are in a state of decay and neglect, from the want of pecuniary resources. Intelligent miners might certainly derive great profit from working these mines: one active individual, by the old Potosi mode of amalgamation, has obtained weekly a clear gain of about 80l. from the residuum formerly thrown away; and in future his profits will be still more considerable, as one of my colleagues has made for him a machine with eight casks, by the use of which he will no longer be subject to such losses of quicksilver, which amounted to about half of the quantity employed.

* Mr. Helms says nothing further concerning this insurrection, of which a circumstantial account would have been highly interesting.

From Oruro to Caracollo, twenty-seven miles.

The summits of the ridge, the direction of which is still northerly, continue to be covered with snow.

Caracollo to Panduro, fifteen miles.

From Panduro to Sicasica, twenty-four miles.

Near the river the valley is very fertile.

From Sicasica to Tambillo, twelve miles.

Two miles from the post-station we found two important amalgamation-works belonging to the Indians, which, from the richness of the ore, are very productive.

From Tambillo to Ayoayo, twelve miles.

Near Ayoayo I found the ground strewed with small shining pure quartzose crystals, partly consisting of half six-sided pyramids of half the size of a lentil. The mountains to the west contain many veins of this rich quartz.

From Ayoayo to Calamarca, fifteen miles.

The same kind of brilliant quartzose crystals, among which small topazes are sometimes found.

From Calamarco to Ventilla, eighteen miles.

From Ventilla to La Paz, twelve miles.

The rich town of La Paz likewise suffered considerably through the revolt of the Indians; but still is said to contain four thousand hearths, and twenty thousand inhabitants, whose chief source of opulence is the *coca*, or tea of Paraguay, as it is called—a greenish, tart herb, which the Indians chew mixed with calcined lime. This article is as indispensable to them as tobacco is to our seamen; and the town of La Paz carries on a lucrative trade with it to the extent of two hundred thousand piastres annually.

The mountain at whose foot La Paz is built, is the highest Cordillera in this part of the country, and covered with everlasting snow.

This mountain, and the whole ridge as far as Sicasica, where the Indians collect gold by washing, abounds in rich gold ore; and when, about eighty years ago, a projecting part of it tumbled down, they severed from the stone lumps of pure gold weighing from two to fifty pounds. Even now, in the layers of sand, &c. washed from the mountain by the rain-water, pieces of pure gold are found, some of which weigh an ounce. From the ignorance, however, of the inhabitants, most of these treasures lie totally neglected.

There are likewise in the argillaceous slate many veins of rich silver-ore.

The province of Tiupani, which is one hundred and twenty miles from La Paz, is said to abound more with gold than even the latter.

From La Paz to La Laja, eighteen miles.

From La Laja to Tiaguanaco, twenty-one miles.

There is upon the whole an ascent from Potosi to this place, and further to Puno, which is the highest point of the Cordilleras of the kingdom of La Plata.

Here likewise the west side of the mountains consists of fine argillaceous slate, and the Indians formerly found much rich ore in it.

From Tiaguanaco to Guaqui, twelve miles.

Here begins the large lake of Tituaca, the first I had seen in South America; and on whose western shore rise the highest Cordilleras of the kingdom of La Plata. Since we left Buenos Ayres and the river de la Plata, we had not passed through so picturesque a country as that bordering on this lake; and were charmed with the alternation of hills and dales, intermixed with the richest meadows, depastured by numerous herds of cattle, mules, horses, and sheep.

From Guaqui to Zepita, twenty one miles.

From Zepita to Chesta, twelve miles.

From Chesta to Pomata, which has a church, and is pleasantly situated, nine miles.

From Pomata to Juli, twelve miles.

We still continued to travel for the most part along the shore of the lake, which we were told is eighty miles in length, and in some parts equally broad.

From Pomata to Juli, a small populous Indian town, with four rich churches, which is governed by an Indian governor, (cazica,) and an Indian judge (alkalde), twelve miles.

From Juli to Uabe, (or Uave) fifteen miles.

At the distance of six miles from Uave, the road diverges from the lake, along the shore of which we had hitherto been travelling with much inconvenience and fatigue, during the rainy season: but, just before we arrived at the post-house, we were ferried over an arm of it, about one hundred and twenty feet in breadth, in an Indian canoe, made in a very neat manner of a kind of reed and grass, on which timid people might be afraid to trust themselves, as they are only one ell and a half in breadth, and quite flat like a raft.

From Uave to Acora, fifteen miles.

From Acora to Chucuito, nine miles.

The mountains contain many rich veins of gold and silver ore.

From Chucuito to Puno, the chief town of the province of the same name, nine miles.

Puno suffered likewise by the above-mentioned insurrection. The silver ores in the neighbourhood are very rich; but the mines are filled with water, and the proprietors have neither the capital nor the skill requisite for draining them.

From Chucuito to Caracato, twenty-four miles.

From Caracato to Calapuja, twenty-one miles.

The ores obtained from a soft porphyritic ridge, extending eighteen miles, are very rich, yielding about ten marks of silver per cwt.

From Calapuja to Pucara, twenty-four miles.

From Pucara to Aguaviri, fifteen miles.

From Aguaviri to Santa Rosa, eighteen miles.

From Santa Rosa to Larucachi, twenty-seven miles.

The ridge of Cordilleras, whose summits are covered with eternal snow, extends far beyond Larucachi. From the badness of the roads, the continual rain, and the dreadful storms of thunder and hail, travelling over the Cordilleras at this season of the year, is attended with almost intolerable hardships. The proper time for such a journey is during the months of March, April, May, June, and July.

During the three months of the rainy season among the mountains, the traveller may proceed along the sea-shore, under a serene sky, and without a single drop of rain, as far as Lima; but, on the contrary, he there is exposed to excessive heat, troublesome vermin, and dangerous fevers.

From Larucachi to Concha, eighteen miles.

The valley becomes wider, and we were obliged frequently to ford a large rapid river. Three miles from Larucachi lies a neat Indian town called Cicuani, the residence of Colonel Manuel Vilalta, governor of Tinta, a very obliging polite gentleman, who gave us a very friendly reception. The colonel, who has been many years engaged in the working of mines in the neighbourhood, listened with great attention to the improvements I suggested for obtaining the metal from the ore.

From Cacha to Chiacupi, twelve miles.

The country becomes more pleasant, fertile, and populous. We passed the broadest arm of the river on a flying bridge, made of basket-work.

From Chiacupi to Quiquijani, fifteen miles.

From Quiquijani to Hurcos, twelve miles.

From Hurcos to Oropeza, nine miles.

The road begins gradually to ascend again, and diverge from the large river which had accompanied us along the valley from Purta, but which now takes another direction towards the south.

From Oropeza to Cusco, formerly the capital of Peru, and the residence of the Incas, twelve miles.

Cusco, like most of the other large cities of Spanish America, is built in the Gothic style. The population is considerable; but no one could give me an exact statement of the number of inhabitants. A governor and a commander of the regular troops and militia reside here. In the palace of the former, a court of

appeal decides upon all the law-suits and processes in the province.

The cathedral is a fine stone building in the modern style, and contains many pictures and rich ornaments.

Although the mountains in the neighbourhood of Cusco contain many rich metallic ores, yet only one person, a French merchant of the name of Grace, is engaged in mining; on which he has already spent, without any advantage, in works after the Indian method, about 5000l. He seemed inclined to adopt our new mode of amalgation; and if his capital should be sufficient to enable him to put that purpose in execution, he will, no doubt, soon realize a large fortune.

From Cusco to Zurito, twenty-one miles.

From Zurito to Limatambo, eighteen miles.

From Limatambo to Carretas, twelve miles.

The base of argillaceous slate is covered with an affluvial super-stratum, which consists of marble, gypsum, lime-stone, sand, a large quantity of rock-salt, and of fragments of pophyry, &c. in which pure silver and rich silver ores occur in abundance. There are few instances in Europe of such mountains so generally abounding with the precious metals, or their ores, as in this quarter of the globe. The whole ridge appears to be full of affluvial veins of heavy silver ores, in which pieces of pure silver, solid copper, and lead-ore, occur, intermixed with a great quantity of white silver ore, and capillary virgin-silver. Thirty-six miles before we reach Guancavelica, behind Parcos, lie mountains of weather-beaten argillaceous slate, mixed with sand. The sections of these mountains consist entirely of separate more or less sharp-pointed pyramids of a flesh-coloured sand-stone.

The ridge of mountains covered with snow, over which the road to the Pacific Ocean passes, consists of simple sand-stone, through which metallic veins, in some places with quartz or feld-spath, in others with steatite and shoerl, &c. openly appear. On the contrary, the chain of mountains to the north of Guamanga and Guancavelica is said to consist, to the extent of one hundred miles, of simple lime-stone, and equally abounds with metallic ores, especially in the province of Tarma.

From Carretas to Carahuasi, eighteen miles.

We were again obliged to pass a river on a flying-bridge. This river is much more rapid and broad than that mentioned above: near Carahuasi it turns off at an angle towards the east, till it enters the kingdom of Curaquin, and is said to run through a space of three thousand miles. This, however, is doubtful: and the more probable opinion is, that it falls into the Maranon.

About sixty miles to the west of Carahuasi some gold mines

are worked; and at Carahuasi, two persons extract silver from a horizontal stratum of ore.

From Avancay to Cochacajas, eighteen miles.

From Cochacajas to Pincos, eighteen miles.

Soon after we left this village, and ascended by a zig-zag road for eight miles, on one of the highest shelves of the highest Cordilleras; and descended with the greatest danger on the other side to the river, which we crossed, and arrived at Pincos, after having been exposed during seven hours to incessant rain: truly pitiable is the lot of the poor traveller who is obliged, during this season of the year, to pursue his journey by such steep and slippery roads, and over almost impassable mountains. Even the most thoughtless free-thinker, who denies the existence of a Providence, would here be obliged to confess, that an almighty and benignant Power evidently watches over the daring steps of mortals; otherwise, both men and beasts would inevitably perish.

Sixty miles westward from Pincos, in the province of Almaray, there are rich veins of gold ore in quartz; and gold is obtained by washing. Some of the Indians here, notwithstanding the rude unskilful process used by them, obtain monthly as much as is worth from nine to eleven hundred pounds, which they send to Lima in exchange for piastres. In this, as indeed in most of the provinces of the kingdom, rich veins of silver and other metallic ores occur, of which no use is made.

From Pincos to Andaguaylas, eighteen miles.

Twenty-one miles beyond the latter place, there is a silver-mine, which was found to yield one hundred marks of silver for every hundred pounds of ore. This mine, however, which is called Santa Maria, has long been full of water.

From Andaguaylas to Uripa, thirty miles.

From Uripa to Tambo de Ocros, thirty-six miles.

Soon after leaving the Uripa, we again climbed to the summit of a vast ridge composed of horizontal strata, and we consumed as much time in the descent towards a rapid river, with a dangerous Indian hanging-bridge, which is about one hundred and twenty feet in length, and suspended by badly-made hempen ropes. Here we were obliged to stop till the bridge was prepaired, and pass the night in a dark mountain cave; where, besides suffering from excessive heat, we were so dreadfully stung by musquitoes, that we scarcely knew one another the next morning.

We had before become acquainted with this little blood-thirsty insect in the province of Tucuman: its sting is much more painful than that of the European knat; it leaves a caustic fluid, which causes the flesh to swell, if the sufferer scratches the part affected; and the itching lasts more than eight days.

The musquitoes are not larger than a flea, but winged, and exactly resembling a young fly. They are very numerous in all the hot low districts of this country.

From Ocros to Congallo, eighteen miles.

From Congallo to the town of Guamanga, the residence of the governor, eighteen miles.

In this district, they dig from a horizontal bed silver ore; fifty hundred weight of which are said to yield five hundred marks of silver. The ore, as appears from the specimen of it in my possession, contains some virgin silver.

But this mine, like most of the rich mines of Peru, is overflowed. The proprietor, however, endeavours to free it as much as possible from water, by means of common pumps.

From Guamanga to Guanta, eighteen miles.

From Guanta to Parcos, thirty miles.

From Parcos to Paucara, twelve miles.

From Paucara to Guancavelica, twenty-four miles.

Behind Guancavelica, the mountains gradually become composed of less various materials, and at last consist only of simple sand-stone, with layers of marl, lime-stone, and spath; or of simple lime-stone: they continue, however, equally rich in gold, silver, quick-silver, rock-salt, &c.

In short, so much doth rich ores abound here, that the mines, if worked with a moderate industry and knowledge of metallurgy, might yield considerably more than the quantity necessary for the supply of the whole world; and it is perhaps a fortunate circumstance, that the ignorance of the miners and the oppressive measures of the Spanish government have prevented more from being drawn from this inexhaustible source than actually has been obtained, and from general experience appears to be required, as a circulating medium in commerce and for other purposes: otherwise, gold and silver must long ago have been depreciated to an inconvenient degree. Indeed, this effect would be produced by the introduction of the fifty or more millions of piastres, that are annually brought to Europe from the Spanish colonies in America, were it not counterbalanced by the immense exportations of silver to China. As none ever finds its way back, it has been conjectured that these treasures are buried by the avaricious Chinese.

The royal mine-town Guancavelica was formerly celebrated on account of its rich quicksilver-mine. But, as this mine was not worked in a proper and regular manner, the pit fell in; and they now dig only in places less abounding with ore; which annually yield about fifteen hundred cwt. of quicksilver: but owing to the wretched manner in which the mines and smelting furnaces are conducted, each hundred of quicksilver costs one hundred and

sixty-six piastres. The king sells it to the proprietors of the gold and silver mines at the rate of seventy-three piastres; and annually loses by his traffic to the amount of two hundred thousand piastres.

The vein of cinnabar was eighty Spanish ells in extent; and the cinnabar was found partly solid and crystallised with galena, calcareous spath, ponderous spath, quartz, manganese, arsenic, &c.; partly intersprinkled in a sand-stone of a very fine grain, or in lime-stone.

So long back as two hundred years ago, the mine was worked with great profit by mining companies; and is said to have been sunk six hundred fathoms deep.

A thick stratum of red arsenic and yellow orpiment, which lay contiguous to the mass of quicksilver-ore, was by the ignorant superintendent taken for cinnabar; and some hundreds of the workmen perished in the operation of smelting it. For extracting the quicksilver from the cinnibar they employ the ill-contrived old Spanish Almadena furnace, which is heated from below with mountain-straw. There are seventy-five such furnaces here: instead of which I proposed to construct sixteen on the plan of those of Idria; but was prevented by the viceroy from executing this purpose.

From Guancavelica to Cotay, thirty miles.

The road ascends towards the snow-covered Cordilleras, and in consequence the air is so cold, that the traveller may wear furs without any inconvenience.

Here we again met with large flocks of lamas. The biscache, a small animal resembling in shape the European rabbit, likewise inhabits these mountains: its fur is uncommonly soft and beautiful. There are likewise large flocks of the well known Vicunna sheep.

From Cotay to Turpo, eighteen miles.

We continued to climb over the snowy summits of the highest ridge since we left Potosi. The cold was more intense than yesterday, and affected me more sensibly than the winters of Germany, although it be still summer here in the month of March.

From Turpo to Vinnas, twenty-four miles.

Having passed, amidst severe frost and snow, the highest Cordilleras of this part of the country, we descended by a very steep road to Vinnas, situated in a narrow valley. During this day's journey, we observed extraordinary large flocks of Vicunna sheep, more numerous than had been seen by us in the other cold regions of South America.

From Vinnas to Jangas, eighteen miles.

During this day's journey we were frequently in the greatest danger, as the path which leads down the steep side of the

mountains towards the river, steering from south to north, is in many places scarcely a quarter of an ell broad; and if the mule make a single false step, both he and his rider are precipitated into the abyss, and dashed to pieces. About an hour after our arrival at the post-house, we learned that one of the king's pack-asses had been thus killed.

From Jangas to Lunaguana, eighteen miles.

The narrow valley through which we travelled to-day has a sandy soil, which produces pomegranates, figs, citrons, oranges, ananas, chirimoyas, grapes, and a variety of other fruits, in abundance.

From Lunaguana to Cannette, eighteen miles.

About a mile and a half from Cannette we at last reached the extremity of the Cordilleras, and entered a sandy plain, through which we continued our journey towards Lima.

From Cannette to Asia, eighteen miles.

From Asia to Mala, twelve miles.

From Mala to Chilca, twelve miles.

Near Chilca I found the flat valleys, between the sea-shore and the hills to the westward, with an incrustation of salt above an inch in thickness. This salt, formed by the heat of the sun, and half crystallized, is carried for sale to Lunaguana.

From Chilca to Lurin, twenty-one miles.

From Lurin to Lima, eighteen miles.

Total—From Potosi to Lima, one thousand two hundred and fifteen miles.

Lima, the vapital of Peru, and the residence of the viceroy, lies in a sandy plain, only two miles in breadth, between the Cordilleras and the sea; which, it is probable, extended formerly above a mile further inland towards the mountains. This, at least, would seem evident from the sea-sand and shells with which the flat ground is covered to the extent of two miles, and from the numerous small hillocks wholly composed of such shells.

Lima is a large city; but on account of the frequent earthquakes, the houses are only one story high, and very slightly constructed with planks, laths, and reeds, plastered over with mortar; the flat roofs being covered with small light shingles. On the outside they have, indeed, a mean appearance, but within they are magnificent and convenient. The streets are very regular, straight, broad, clean, and well paved; and in almost all of them are palaces of the rich nobles; some of which are built in the modern style of architecture. Alleys shaded with rows of high lime-trees, country-houses, and gardens, embellish the environs of the city; which would certainly be a most charming place of abode were it less subject to disease and earthquakes,

and if the inhabitants suffered less from the excessive heat and swarms of every kind of vermin.

The whole coast on the South Sea is here subject to frequent earthquakes: one of which about fifty ago years destroyed Lima, and the extensive seaport Callao, the latter of which was overwhelmed by the waves of the raging ocean. The ruins of Callao are still visible; but the citadel, which was on an eminence considerably higher than the city, remains standing.

The rich commercial city of Ariquipa has likewise been converted by earthquakes into a heap of ruins; on which, however, fresh inhabitants have been tempted to build, on account of its advantageous situation. With regard to earthquakes, the month of October is the most dangerous season.

The population of Lima was formerly estimated at seventy thousand; at present, owing to the total decay of trade in Peru, it is said to have decreased one-third, and to have sunk so low as fifty thousand Spaniards, people of colour, and negroes.

So late as thirty years ago, Lima was one of the richest and most flourishing cities in Spanish America. But since that time the markets have been so overstocked with European goods, that the capitals of most of the commercial houses became invested in piece and other goods, and all the ready money by degrees emigrated to Cadiz; which necessarily occasioned an excessive fall in the value of European articles of merchandize. A pair of French silk-stockings, which then cost forty piastres, may be now purchased for six; and in like manner all European goods have sunk to one third of their former price, and even lower. Thus the merchant gradually lost the capital which he had risked in trade, and was totally ruined. The same is said to be the case in all the other commercial cities of the Spanish colonies in South America. The consequent scarcity of money caused an almost total stoppage in the working of the mines; and it seemed as if this source of wealth in Peru would be wholly dried up. To prevent this, the viceroy, La Croix, an intelligent, disinterested, and generally beloved Netherlander, had requested of the king to send over to Peru skilful German miners and mineralogists, possessed of the requisite talents and knowledge; and in the mean time erected, at the expence of the proprietors of the mines, a supreme tribunal of the mines, on the plan of a similar tribunal in Mexico. On my arrival in Peru, however, I found that the members who composed this supreme court were entirely destitute of mineralogical knowledge: and the Peruvian board of mines has not yet expended a single penny for promoting the working of any of the numerous mines under their jurisdiction. Of this the proprietors loudly complain; but their complaints are no where attended to. Government not only leaves them to

themselves without any support, but likewise depresses them by vexatious processes and chicanery, and by executions on the slightest refusal; by which many have been driven from their homes. The sub-delegates, or judges, in the mining, districts, are more especially the greatest villains, who enrich themselves by their unjust acts of tyranny, and continually accuse the subjects of sedition and rebellion; while the viceroy, who resides in the capital, and is a stranger to the extensive region committed to his care, gives himself little trouble about the burthens and oppressions under which the people groan.

I staid only three weeks at Lima, during which time I had several private interviews with the viceroy; who, at the desire of the governor of Guancavelica, ordered me to proceed to that place, as director of the royal quicksilver works, for the purpose of introducing the Idrian, instead of the ill-contrived and wasteful Almadena furnaces. Having received my commission and written instructions, I accordingly left the capital, and arrived at Guancavelica on the 6th of May, 1790, accompanied by my family and five German miners. The sudden transition from the hot climate of Lima to the cold mountainous regions, threw my wife, servants, and miners, into an intermittent fever, from which my wife did not recover till seven months after, by a change of place and air.

I soon discovered that, in procuring me this commission, M. de Tagle, the governor (an old Creole) who, by pretended patriotic projects, had amassed a fortune of a million of piastres, had no other end in view but to derive a profit from furnishing the necessary building materials, for which he received more than four times their value. I accordingly protested against these nefarious proceedings, and began to make my own bricks, which cost no more than half a piastre per hundred, though the governor's workmen had charged 25 piastres for the same quantity. The governor, however, still counteracted my plans for saving the king's money, by endeavouring to force useless labourers and overseers upon me. These attempts I resolutely resisted; and on my threatening to return again immediately to Lima, he at length suffered me to go on in my own way, and the erecting of the furnaces proceeded with unremitted diligence: but before I could finish them, the governor, having persuaded the viceroy that the Idrian furnaces, though they would cost twice as much as the old ones, were wholly unfit for the intended purpose, procured an order to suspend the work. I easily proved the untruth of these malicious representations, and the governor was in consequence recalled to Lima, to give an account of his conduct; as it appeared that during the three years of his administration only from 13 to 14 thousand cwt. of quicksilver had been produced, at an

expence of 166 piastres per cwt.; though his predecessor had furnished annually 2000 cwts., at from 99 to 100 piastres per cwt. I could not, however, get the suspension taken off.

I then proposed to the viceroy plans for erecting machinery for pounding and washing the ore, which yield only 1-4 per cent. of quicksilver; and proved that 16 of my Idrian furnaces would thus produce as much as the 75 old ones. These plans were rejected by the viceroy, on account of the expence, which I estimated at 100,000 piastres, though the king annually loses above 200,000 by bad management, and an unnecessary number of officers, and the excessive consuption of fuel, which is very scarce and dear.

An order was soon after sent to me to proceed to the province of Tarma, as superintendent of the celebrated mines of Pasco. This was a fortunate circumstance, a change of air being necessary for the re-establishment of my health, as vexation at the unjust treatment I had met with had thrown me into a violent fever, which during four weeks endangered my life.

The province of Guancavelica contains many extraordinary rich strata and veins of gold, silver, copper, and lead ores, the greatest part of which, however, lie quite neglected, or the pits are not sunk to a sufficient depth. Some of the ores yield from 9 to 10 marks, and others 22 marks of silver in every 50 cwt.

On the 14th of January 1791, I left Guancavelica, and proceeded to Guando, eighteen miles.

Immediately after leaving Guando, we descended into a deep valley towards Iscuchaca; near which place we crossed the broad and rapid river Anguiacu, over a neat stone bridge.

From Guando to Acostambo, eighteen miles.

From Acostambo to Guaiucachi, eighteen miles.

From Guaiucachi to Guanjaia, six miles.

The valley becomes broader, and is uncommonly pleasant and fertile. On each side of the river are many towns and villages inhabited by Spaniards, Indians, and Creoles. Guanjaia contains a parish church, a chapel, and well-built houses, belonging to the rich landholders of the district; and its markets are abundantly supplied.

From Guanjaia to Matuguasi, fifteen miles.

From Matuguasi to Gauxa, fifteen miles.

Gauxa is a small town with two churches and well-built houses. Here the sub-delegate resides, whose jurisdiction extends as far as Gauiucachi.

From Gauxa to Tarma, twenty-four miles.

Tarma is the capital of a government of the same name, is situated in a deep narrow valley, and inhabited chiefly by Creoles, Mestizos, and Indians. The adjoining district is very fertile,

but the climate unhealthy; as the surrounding high mountains prevent a free circulation of air. Near this place are two quick-silver-mines, one of which was dug into an iron-spath vein of five ells, with solid and volatilised cinnabar; both, however, were yet only a few fathoms deep. Here likewise two veins with antimony and white silver-ore are worked; and in several pits they dug native salt-petre of an excellent quality.

From Tarma to Palcamayo, fifteen miles.

From Palcamayo to Reyes, eighteen miles.

From this place to Pasco, they have no other fuel but a kind of peat, with which the high mountains are covered a foot deep.

From Reyes to Carhuamayo, fifteen miles.

About a mile from Reyes, to the west of the mountains, begins a large lake fourteen miles in length.

From Carhumayo to Pasco, fifteen miles.

Pasco is only a small town, where the sub-delegate and the officers who superintend the refining-house, and collect the king's duties, and some wealthy proprietors of mines, reside. Most of the other proprietors live at their mines on the great silver mountain Jauricocha, distant about six miles from Pasco.

Jauricocha contains a prodigious mass of ore (half a mile long, equally broad, but in depth only fifteen fathoms), of fine porous brown iron-stone, which is throughout interspersed with pure silver. This iron-stone itself contains, indeed, at most nine marks of silver in every fifty hundred weight: of which, however, the unskilful Indian metallurgist gains from the smelting-furnace only from four to seven marks. But a friable white metallic argil in the middle of the mass of ore, about one-quarter of an ell in thickness, yields from two hundred to one thousand marks of fine silver in every fifty hundred weight. Wherever the miner hits upon this immense vein, he finds ores containing more or less of silver. This has induced a number of needy and ignorant adventurers to perforate the mass of ore with innumerable holes, without order or regulation; so that it is wonderful that the whole mine had not long ago fallen in, which will probably be the case in less than forty years: single pits frequently tumble in and kill the workmen; but such accidents excite very little attention.

Above two hundred private proprietors and workers of mines have their pits on this mountain, and annually extract about two hundred thousand marks of silver.

After I had spent two months in examining into the state of the mines and smelting-houses, I sent a long report to the vice-roy, in which I pointed out all the defects I had observed, and proposed what I thought the best means for rendering them more productive, and the working of them permanently advantageous.

both to the private proprietors and adventurers, and to the king's treasury. But neither here nor at Bellavista, in the province of Cajatambo, a hundred and thirty-five miles from Lima, was I able to effect any thing.

The viceroy absolutely refused any pecuniary assistance from the funds appropriated to the improvement of the mines; and would not approve of the plan for raising the necessary supplies by a loan. All I could obtain was a commendatory epistle in praise of my zeal. I therefore resolved to remain no longer in Peru—a land morally and physically pernicious to me;—where I had sacrificed my health to the conscientious discharge of duty; having been obliged, in the execution of the most dangerous and laborious commissions, to act not only as a director of the smelting-houses, but likewise as carpenter, smith, and mason; and where I had endeavoured by every means to dispel the incredible ignorance and barbarism prevailing in the mint and mining departments, by erecting laboratories, and reading lectures with suitable experiments.

But the overseers and officers of the mines, whose want of skill and malpractices I exposed, counteracted with all their might the royal commissioners, by secret cabals and the basest calumnies. In writing and in conversation they decried the Germans as arch-heretics, German Jews, and cheats; as men, in short, who, it was to be feared, would corrupt the morals of the honest miners and overseers; and tried every means to render them suspicious to the proprietors of the mines, fearing lest, by listening to our instructions, they might be induced to examine too narrowly into the conduct of their ignorant and dishonest servants.

They even excited the Indian labourers against us, by insinuating that the foreigners had come solely for the purpose of working the mines by machinery, and would thus deprive them of the means of subsistence. In this opposition they were encouraged and joined by a numerous band of merchants in the principal cities; as I had spoken loudly against the enormous usury of from 30 to 40 per cent. by which they oppressed the workers of the mines, and made every effort to put a stop to their rapacity.

Before I take a final leave of South America, I shall, for the information of my readers, give a few general observations relative to Buenos Ayres and Peru.

The gold and silver mines are the chief source of riches in this country. The inland trade of the provinces is inconsiderable, on account of the want of culture, and the thinness of the population; and the foreign commerce is of the passive kind, being almost entirely in the hands of Europeans.

Almost all the mines in Peru were first opened by deserters from the army and navy, sailors, and other vagabonds; and continued to be worked without observance of the mine-laws and regulations, as if merely for the sake of plunder; and most of them are even at present in this wretched condition.

In 1789, three million five hundred and seventy thousand piastres in silver, and seven hundred and sixty-six thousand seven hundred and sixty-eight piastres in gold, wer coined at the royal mint of Lima; and in the year 1790, five hundred and thirty-four thousand marks of silver, and six thousand and thirty-eight marks of gold. Of these sums above one half was the produce of the mines of Gualgayoc and Pasco. The mines of Guantajaya, in the government of Ariquipa, three hundred miles from Lima, and six from the sea-port Iquique, annually yield thirty-eight thousand marks of silver; but might yield a considerable greater quantity, if it were not situated in the dry burning sandy desert on the sea-shore. Fresh water must be fetched from a distance of from twenty to thirty miles; and a common drinking-glass full is sometimes sold at the rate of a piastre. The ores there dug out are for the most part rich horn ores; and sometimes they meet with large lumps of pure silver.

If Peru, Chili, and Buenos Ayres, possessed the same advantages as the more populous and industrious kingdom of Mexico, where royal and private banks are established for the support and furthering of the mines, and advancing money to the workers of them, and where, as it is less distant from the mother country, a stricter obedience is paid to the laws, and a better system of policy and economy prevails—Peru (where every thing still remains in a state of chaotic confusion) might alone furnish annually a four times greater quantity of gold and silver than Mexico, which abounds less with these precious metals. But this is very far from being the case.

From authentic registers transmitted to the governors of the different provinces, it appears that from the 1st of January to the 31st of December, 1790, they coined in the royal mints

	In Gold Piastres.	*In Silver* Piastres.	*Total* Piastres.
At Mexico	62 ,044	17,435,644	18,063,688
At Lima	821,168	4,341,071	5,162,239
At Potosi	299,846	3,983,176	4,283,022
At St. Jago	721,754	146,132	867,886
Total	2,470,812	2,5906,023	28,376,835

The same in English money, reckoning the piastres at 3s. 7d.

Places.	Gold.			Silver.			Total.		
	l.	*s.*	*d.*	*l.*	*s.*	*d.*	*l.*	*s.*	*d.*
Mexico	112,524	11	0	3,123,886	4	4	3,236,410	15	4
Lima	147,125	13	8	772,775	4	5	919,901	3	1
Potosi	53,723	8	2	713,652	7	4	767,374	15	6
St. Jago	129,314	5	2	26,181	19	8	155,496	4	10
Total	442,687	3	0	4,636,495	15	9	5,079,182	18	0

If to these sums we add the gold and silver fabricated into various utensils for churches, convents, and private persons; and the sums clandestinely exported by the merchants without being coined, which is supposed to amount to a third, or even to one half of the whole, we may venture to estimate the annual produce at about nine millions sterling.

When the silver has been melted and refined at the royal mint, the following duties are deducted:

One half per cent. cobos, or old established duty to the king.

Six per cent. real diesmo, or the king's tythe.

Six per cent. derechos de fundicion, or to defray the expence of melting and refining, for one bar of two hundred marks.

On every mark of silver, one real de la Plata for the salaries, &c. of the royal tribunal of the mines.

As soon as the silver is melted, stamped, and proved, eight piastres, five reals, and thirteen marvedis de Plata, is, according to the regulations of the mint, paid for each mark.

Gold only pays four per cent. duty; and after deducting the expence of melting and proving it, the royal treasury allows sixteen piastres for it, if it be of the fineness of twenty-two carats.

The physicians having certified that, from the deranged state of my health, I could not without the most imminent danger of my life continue to act as commissioner of the mines of the Cordilleras, the viceroy reluctantly gave me permission to return to Europe. Accordingly on the 25th December, 1792, I sailed from Callao, the port of Lima, in lat. 12° 3′ S. and long. 298° 30′, on board a register-ship; which proceeded to Europe by Cape Horn.

On the 28th of May, 1793, I safely arrived at Cadiz, and immediately set out for Madrid; where, after spending seven months in tedious solicitations to have the terms of my agreement fulfilled, I at last obtained, as a reward for my services, a small pension for life.

APPENDIX;

Containing Particulars, methodically arranged, of the various Countries belonging to Spain in South America, compiled and translated by the English Editor, from the latest and best Authorities.*

SPANISH America is divided into FOUR vice-royalties, of unequal dimensions, viz.

That of Mexico, or New Spain, comprehending New Gallicia, New Biscay, New Navarre, New Leon, New Mexico, the Floridas, and the two Callifornias.

That of New Grenada, comprehending Terra Firma, Panama, Veraguay, and the province of Quito.

That of Lima, comprehending Peru and Chili.

And that of la Plata, comprehending Paraguay, Tucuman, and a part of the former Peru.

Between the 40th deg. of N. lat. and the 50th deg. of S. lat. lie these kingdoms of Mexico, New Grenada, Lima, and La Plata. They extend more than 6,000 geographical miles in length, and are from 60 to 900 miles in breadth. The population has been estimated at about five millions of Spaniards and people of various colours, and about as many Negroes and wild Indians.

In order to facilitate the administration of justice, the provinces are divided into *audicencies*, which are again subdivided into *partidos*. They are also divided into military districts, which are under the authority of captains-general, governors, and commanders.

The viceroys maintain a splendid court, though their power is extremely limited, from the authority possessed by the judges, and from their not being permitted to interfere with the colonial treasures, or the military or marine forces.

The military department is much neglected in all the Spanish possessions; the militia being found sufficient to keep the Indians in subjection: and the marine is confined to ten corvettes, or armed galleons, stationed along a coast extending from nine to twelve thousand miles!

All colonial affairs are finally referred to the *Council of the Indies*, which holds its sittings at Madrid, and of which the *minister of the Indies* is the perpetual president.

The inhabitants of these immense territories have, during three

* See the conclusion of the preface.

centuries, groaned under the severest despotism, so that commerce has been injured, agriculture neglected, and the exertions of industry paralyzed, and in a great measure rendered abortive. Galleons, and afterwards register-ships, were exclusively permitted to carry out European merchandize to the colonies, and in return brought back the gold and silver drawn from the mines of the new world, which the indolent Spaniards saw with perfect apathy go to enrich the surrounding commercial nations.

Spain did not, however, succeed in her projects of monopoly, as the other European nations, which were prohibited by the most severe laws from entering any of her colonial ports, nevertheless contrived, with a boldness and perseverance equal to the importance of the object they had in view, to supply these countries with every article of which they might stand in need. In particular our own merchants, as well as those of Holland, employed by turns, gold and the force of arms, to counteract the vigilance of the Spanish *guarda costas*, stationed along the coast, to prevent such contraband traffic. The idea was indeed equally absurd and impolitic, to endeavour to shut out the one half of the world from all connection with the other.

From these and other circumstances, no advantage has hitherto been derived from the precious metals, either by America herself or the mother country; since the former is not permitted to exchange her gold and silver for those commodities of which she may stand in need, and the latter is at no pains to supply those wants.

In 1778, Galvez, at that time minister of American affairs, endeavoured to produce some changes in their absent colonial system. Under his administration, thirteen principal ports in Old Spain were successively permitted to engage in a free trade with the colonies. But this minister still wished to prevent, as far as possible, other nations from a participation in the benefits to be derived from this trade, which was the reason why he only rendered a very few of the American ports free, and established a most rigorous system of police, in order to prevent the introduction of contraband commodities. We are informed by M. Bourgoing, in his view of Spain, that this liberty was not extended to the Spanish colonies in general till 1785.

However paradoxical it may appear, several Spaniards affirm, that those prohibitory measures have tended rather to increase than diminish this illicit commerce; but the best informed mercantile men assert, on the contrary, that since this period, the manufactures of Old Spain have been greatly improved and multiplied: the linens of Navarre and Arragon, the cloths of Segovia, the silks of Valencia, besides various other articles, render the Spanish commerce less dependant on foreign importations.

During 1778, the first year after the establishment of those new regulations, the following number of vessels were freighted for South America, from seven of the principal ports of Spain.

The subjoined tables shew at one view the value of their cargoes in British money, and the proportion between the exports of Spanish produce, and that furnished by other states.

PORTS.	No. of ships.	Value of Spanish Produce.	Value of Foreign Produce.	Duties Paid.
		l.	*l.*	*l.*
From Cadiz - - - -	63	332,701	927,543	66,926
—— Corunna - -	25	69,691	66,826	7,184
—— Barcelona	23	163,290	52,513	8,384
—— Malaga - -	34	85,657	12,927	3,618
—— St. Andero	13	19,128	99,807	7,666
—— Alicant - -	3	5,299	2,308	328
—— St. Croix, in Teneriffe	9	30,165		1,735
Total	170	705,911	1,156,924	95,841

Table shewing the amount of the imports into Spain from South America, in 1778:

PORTS.	No. of ships.	Value of the Cargoes.		Amount of the Duties.	
		l.	*s.*	*l.*	*s.*
To Cadiz - - - - - - -	57	860,257	2	24,388	7
—— Corunna - - - -	21	683,328	6	43,386	10
—— Barcelona - - - -	25	107,713	15	1,931	15
—— Malaga - - - - -	10	24,745	14	119	15
—— St. Andero - - -	8	114,852	9	1,680	6
—— Alicant - - - - -	8	29,895	13		
—— St. Croix, in Teneriffe - - - -	6	43,164	4	2,779	18
Total	135	1,863,957	3	74,286	11

From 1778 to 1788, the number of free ports in the mother country, had been increased from seven to twelve. The exportations of Spanish merchandize had also, during the same period, been more than quintupled, the exports of foreign products in Spanish bottoms more than tripled, and the imports from America in return augmented by more than nine tenths.

The following table given in M. Bourgoing's account of Spain, exhibits at one view the amount of the Spanish exports and imports to and from South America during 1788:

PORTS.	Value of Spanish Produce.		Value of Foreign Produce.		Value of Colonial Imports.	
	l.	*s.*	*l.*	*s.*	*l.*	*s.*
Seville	95,275	19	14,342	4	3,249	5
Cadiz	2,281,310	13	3,038,345	13	18,382,895	16
Malaga	318 801	2	33,683	17	296,738	2
Barcelona	742,209	16	52,082	18	886,162	8
Corunna	249,838	8			2,040,639	14
St. Sebastian	9,113	18	79,488	7	253,888	5
Alfacks of Tortosa	21,609	12	360	2	6,230	17
St. Andero	127,071	13	281,948	15	657,398	2
Gijon	1,544	7	28,299	16	16,052	5
Alicant	13,564	8	815	0	15,877	15
Palma	14,971	17			6,852	2
Canaries	55,264	8	32,990	12	71,585	18
Total	*l.* 3,930.576	1	3,562,357	4	22,667,320	9

From the preceding table it appears that the total value of the imports from South America, during 1788, amounted to . . . . . £.22,667,320 9

And the total of the exports to . . 7,493,933 5

So that the imports exceed the exports by £.15,173,387 4

In 1788, the duties on the exports and imports amounted to 1,386,423 14

Whereas in 1778 they produced . . 169,032 5

Surplus in 1788 . . . . £.1,217,391 9

From various authorities, it appears certain, that Spain has, since 1788, exported to South America more wines, fruits, and manufactured productions, than formerly; it is equally certain, that she has also since imported a greater quantity of tobacco, sugar, coffee, and other commodities from her American possessions, though these are still far from having obtained that degree of perfection of which they are susceptible; that, in short, the intercourse between the mother country and her colonies has become much greater than at any former period. Previous to 1778, twelve or fifteen vessels only were engaged in the colonial trade, and these never performed more than one voyage in the course of three years; but in 1791, eighty-nine ships cleared out from different Spanish ports for South America.

It is not easy to ascertain the exact quantity of gold and silver drawn by Spain from the mines in her American colonies. Part of these metals is converted into current coin at Lima, Santa-Fé, Carthagena, and especially in Mexico, but a part also is sent under the form of ingots, either clandestinely or legally, to the mother country. Some judgment might be formed of the quantity of precious metals obtained from the mines, by the duties levied on their produce; but these have greatly fluctuated, nor have they been at all times uniform in every part

of Spanish America. The duty at first levied was one fifth, but this was, in some cases, afterwards reduced to one tenth, and in others to one twentieth.

In 1552, Charles V. added to this duty 1½ per cent. to defray the expence of coinage, &c.; at a later period, the duty of one fifth was reduced in Peru and Mexico, to one tenth.

According to the latest assessments, the duty on silver is 11½ per cent. and on gold 3 per cent. From these data, it might, therefore, be supposed that a pretty accurate estimate could be formed of the annual produce of the mines; but the amount of these duties being frequently confounded in the custom-house accounts, with those on quicksilver, paper, &c. they afford no just criterion on the subject.

The most accurate information respecting this matter is, perhaps, to be found in the statement given by M. Helms, which makes the produce almost FIVE MILLIONS, in 1790, nearly three of which were in Mexico.

In 1791, Spanish as well as foreign merchants, received permission to import Negro slaves and hardware, and to export the productions of La Plata. This encouragement has contributed greatly to the advancement of agriculture, and the increase of population. The pasture-grounds support millions of oxen, horses, sheep, and swine. Such numbers of horned cattle are reared, that in the year 1792, 825,609 ox hides were shipped for Spain alone. There is an abundance of salt in that province; and no want of convenient places where boats and ships may take in a cargo of salted flesh for exportation. The Rio de la Plata, the Uraguay, Parana, and other smaller streams, afford great advantages in this respect.

In 1796, there arrived 35 loaded ships at Buenos Ayres from Cadiz; twenty-two from Barcelona, Malaga, and Alsaquez; nine from Corunna; five from St. Andero; one from Vigo; and one from Gijon. The value of that part of the cargoes which consisted of Spanish productions, amounted to 1,705,866 American dollars. The value of the following manufactures, &c. which were imported in the above ships, amounted to 1,148,078; and the sum total of both, to 2,853,944 piastres. On the other hand, there sailed from Buenos Ayres twenty-six ships for Cadiz; ten for Barcelona, Malaga, and Alicant; eleven for Corunna; and four for St. Andero. These carried coined and uncoined gold of the value of 1,425,701 piastres. The value of the silver exported amounted to nearly 2,556,304, and that of the other productions of the province to 1,076,877 piastres. The value of all the exports consequently amounted to 5,058,882. The goods exported consisted of 874,593 raw ox hides; 43,752 horse hides; 24,436 skins of a finer sort; 46,800 arrobes of melted

tallow; 771 arrobes of Vicunna wool; 2264 arrobes of common wool; and 291 arrobes of the wool of the Guanaco, or camel sheep; 11,890 goose wings; 451,000 ox horns; 3223 cwt. of copper; 4 cwt. tin; 2541 tanned hides; 222 dozen of manufactured sheep skins; 2128 cwt. of salted beef; and 185 cwt. of salted pork.

The increase of trade in the province of La Plata clearly appears from a comparative statement of the imports and exports of 1795 and 1796. In this latter year there were imported 932,481 piastres worth of goods from Spain; 760,361 piastres worth from the Havannah; and 50,154 piastres worth from Lima, more than in the year immediately preceding.

ACCOUNT OF THE VICEROYALTY OF LA PLATA.

THIS portion of South America may be said to consist of four distinct and grand divisions, viz. the audiency of *Charcas*, or the detached provinces adjoining Peru; the government of *Paraguay proper;* that of *Buenos Ayres;* and *Tucuman*, with *New Chili*, or the provinces of Chili which lie to the east of the Andes, and do not belong to the presidency of St. Jago.

In the greater part of this viceroyalty the subdivisions constantly undergo changes; for new colonies are suddenly founded, and ancient ones are frequently abandoned.

CHARCAS; OR, SOUTHERN PERU.

This *audiency* is, according to some authors, divided into several large provinces or governments, of which the following are the principal:

Moxos. This province is very extensive: it joins to the south with that of Santa-Cruz de la Sierra, and the lands of the Chiquito Indians: to the east it borders on Brasil. It is upwards of 450 miles long from north to south; and nearly 600 broad from east to west. The air is hot and moist, on account of the rivers and vast forests which the country contains. This province is fertile, and abounds in plants, grain, and fruits, which require much heat to bring them to perfection: such, for example, as maize, sugar-canes, yucas (a plant which is made into bread in almost every part of America, and which by many Europeans is prefered to that of wheat,) rice, the *platanos*, which the Indians consider as their best aliment, and *green ajos*, a species of green pear. They obtain abundant harvests of cotton and cocoa-nuts, the pulp of which is so tender and rich, that the chocolate which is made from it is of a better taste, and more

nourishing than any er kind. In the forests are found, guaiacum-wood, cinnamon, and a tree called *maria*, from which a medicinal oil is acquired, which is highly esteemed for its virtue in bracing the stomach. The country also produces quinquina, or Peruvian bark, cedar-wood, and almond-trees, which are different from those of Europe; besides vanilla, and a quantity of wax. Many wild animals are to be met with, particularly tigers, bears, and hogs. The rivers swarm with fish.

SANTA-CRUZ DE LA SIERRA. This province is bounded on the north by that of Moxos; to the east by the Chiquito Indians; and to the west by that of Mizque. It is a country intersected by hills, and its climate, though hot, is not so moist as that of Moxos. It produces a sort of palm wood, which is so hard that it is used for making balconies, and other purposes which require great strength. There is another species of it, called *motaqui*, the large leaves of which are used as thatch for houses, while the small ones are eaten as a sallad by the poorer sort of people. From the body of the tree a flour is obtained, which the people make into very pleasant cakes, and eat as bread. This province abounds with all sorts of birds, as well as with tigers, bears, and hogs. The soil produces rice, maize, sugar-canes, &c. and the bees afford quantities of wax.

About sixty miles to the south of the capital are four hordes of Indians, who are on friendly terms with the Spaniards, and supply them with wax, cotton, and maize. There are other Indians to the east of the river of Paraguay, who are such barbarians that they eat their prisoners. These people have a custom of going to the river at midnight to bathe; and whatever may be the weather, their women also bathe in the open air as soon as they have lain in; when, on returning from their ablutions, they roll themselves on a heap of sand, which they keep in their houses for that purpose.

The new Santa-Cruz de la Sierra (for the old town, which was more towards the south, is destroyed,) is a large city, well peopled, and has a governor and a bishop: the latter, however, resides at *Misque Pocona*.

The cruelty which characterized the first Spanish colonists, gave rise to a shocking degree of anarchy, which has ever since prevailed through those countries. Muratori thus describes their conduct: "Some Spanish merchants," says he, "who had established themselves on the other side of the Peruvian mountains, and particularly those of Santa-Cruz de la Sierra, formed amongst them a kind of union or company, the object of which was to make slaves of the Indians, and sell them. They entered the Indian territory, particularly the country of the Chiquitos, with arms in their hands, travelled to the distance of a hundred and twenty

miles, all the way chasing the savages, as hunters do their prey; and if the spoil which they made on the lands of their enemies were not equal to their wishes, they suddenly fell upon the neighbouring hordes, with whom they were at peace, put them without mercy to the sword, or burned alive in their cabins all who attempted to resist them, while the rest were taken as slaves. To give the colour of justice to their barbarous attacks, they always pretended to have received some injury. On returning they sold their slaves for any price to men who conducted them in chains to Peru, and gained a considerable profit by selling them again. This trade produced several thousand piastres per annum to those who were concerned in it."

CHUQUISACA. This province is the first which bore the name of Chaco, a name which may be said to have afterwards performed a journey; as it gradually extended to the southward, and now comprises the low countries and plains between Paraguay and Pilcomayo.

La Plata, or Chuquisaca, the capital, was first called La Plata, on account of a famous silver mine, which was in the mountain of Porco, near the city in question, and from which the incas derived immense sums. The nobility of this place are the most distinguished of any in Peru, and they still retain many privileges. The number of the inhabitants is about 14,000, amongst whom are many Spaniards. This city is the residence of an archbishop, whose authority extends over the whole viceroyalty.

POTOSI. This *corregidory** contains the famous silver mines which have been so often mentioned. These mines afforded, between the years 1545 and 1648, the enormous sum of 80,000,000 of pounds sterling; and they are still far from exhaustion. The metal continues to be abundant, though the most accessible part has been taken away, and the Spaniards will not give themselves the trouble to sink these mines very deep, because there are in Peru, and even in the vicinity of Potosi, many others which can be more easily worked.

The city or town of Potosi contains, according to *Helms*, 100,000 souls, inclusive of slaves; but other writers state the numbers at not more than 50,000. We ought, however, to prefer the testimony of *Helms*, because he resided many years in that country. Potosi is the seat of the administration of the mines, and the tribunals that relate thereto: it is the centre of a very considerable commerce, which is conveyed by the river Pilcomayo.

* A cerregidory is a district, which is governed by a Spanish magistrate, called a *Corregidor*. His office combines the duties of a deputy governor, and a justice of the peace.

The following corregidories are situated to the north of Potosi and Chuquisaca.

SICASICA. This corregidory, which takes its name from the capital, joins, to the north and north-east, with the province of Larecaja, in the bishopric of La Paz: it is one of the largest corregidories in the viceroyalty. All sorts of cattle are bred in it; and it produces every kind of fruit, as well as sugar-canes, cocoa, and good wine. The bark of this district is as good as that of Loxa. Its forests afford several valuable sorts of wood, and it is said to contain two rich gold mines. The inhabitants make the wool of their sheep into various kinds of stuffs.

ORCAO. This corregidory, the capital of which bears the same name, joins on the north with that of Sicasica. It is subject to storms. A quantity of gunpowder is made in it, and it formerly contained some excellent mines of gold and silver, which have been much degraded by inundations. This province extends fifty-four miles from east to west, and twenty from north to south. Its mines still produce annually about 600 bars of silver, which weigh about eight ounces a-piece.

JAMPARAES. This corregidory produces fruits, yams, barley, wheat, maize, &c. which are sent to the cities of La Plata and Potosi. It has a considerable salt-mine, and the country furnishes wine and sugar. Amongst several wild birds which it contains, there is one called *the carpenter*, as it perforates the trees with its beak, and builds its nests in the holes.

MISQUE. This corregidory joins to the south with that of Jamparaes. Its production consists of maize, pulse, sugar-canes, and wine, and its forests afford cedars, bark, &c. It also has a silver mine.

CAYATA. This corregidory, which bears the same name as the capital, borders to the east on that of Jamparaes. It is 108 miles long from east to west, by 132 in breadth, from north to south. Its temperature is very variable. In its valleys wheat and maize are grown, and cattle of every kind are reared. It contains two mines of gold, three of silver, one of copper, one of lead, and one of tin. The forests furnish different sorts of wood, and a number of parroquets harbour in the trees: they also abound in bees, whose honey is well known by the name of the Charcas kind.

COCHABAMBA. This corregidory, the capital of which is Oropesa, borders to the south on that of Cayata; and to the west on that of Sicasica. It is 120 miles long, by 96 broad; and is called, with propriety, the granary of Peru: for it produces vast quantities of grain and seeds. The fruits of the valley of Arqua are much celebrated. In the higher parts they breed

sheep and horned cattle. Formerly much gold was derived from this district, and very lucrative veins are still met with.

Carangas. This corregidory, the capital of which is Tarupaca, contiguous to the laguna, or lake, called *das Aullagas*, is 108 miles long, by 90 in breadth. A number of cattle and hogs are reared in it, as well as Peruvian sheep. It has silver mines, which are well worked, and in which lumps of massive silver are found, that, according to Ulloa, often weigh 75lbs. and upwards each.

Paria. This corregidory likewise bears the name of its capital: it borders to the north on that of Sicasica; and to the west on that of Carangas. The people rear Peruvian sheep and lamas. It contains salt mines, saline lakes, and hot springs. There are worked in it a mine of silver, one of tin, and one of lead.

Pilaya and Paspaya. The capital of this corregidory is called Cinti. It abounds in fruits and wine; and they make from the grapes a very celebrated sort of brandy.

Tomina. This corregidory bears the same name as its capital, and is 72 miles in length, by 210 in circumference; but one part of it is occupied by Indians. Its climate is very hot, particularly in the vallies. It abounds in fruits, and plantations of sugar-canes, the latter of which are said to last thirty years. There are also quantities of cattle and horses. In a village called Olopo, a district of Tomina, the natives are so little and deformed, that they seem like pigmies. They are also much afflicted with ruptures.

Porco. The corregidory so called, whose capital is Talvevara de Puna, is 180 miles long, and 120 broad. The inhabitants rear great numbers of cattle, sheep, and guanacos. There are hot springs; and the principal revenues arise from the produce of two gold mines, one silver mine, and one of copper. A single miner some years ago found in the district of Tomaheur, a lump of metal worth 3,000,000 of dollars*.

Atacama. The capital of this corregidory bears the name of *St. François d'Atacama*. It is bounded on the north by the province of Arica; on the south by Chili; and on the west by the South Sea. It abounds in fruits and seeds; and the mountains produce ostriches and numbers of Peruvian sheep. There

* In commerce, the Spaniards give the name of *piastre* to the common Spanish dollar: though there is a coin of the same kind, which circulates in Portugal and Spain under the name of piastre, and which is something inferior in value. The piastre of Italy passes for five shillings sterling, that of Spain for three shillings and seven-pence. If we estimate the value of this lump, according to the piastre of three shillings and seven pence, its amount will be 537,500*l.*!

are also two silver mines, two of gold, one of copper, and one of lead, as well as some hot springs, and a lake, the water of which is as salt as that of the sea. Talc and alum are also found here.

Lipes. This corregidory, whose capital is of the same name, borders to the east on that of Atacama. It is 180 miles long, by 60 in breadth; and it affords an excellent kind of bark, and a sort of millet. There are also numbers of ostriches, partridges, and Peruvian sheep; and in the plains are found salt, salt-petre, and sulphur. It also contains mines of red and white copper, the strata of which are intermixed with gold and silver, iron and loadstone. The silver mine is very abundant.

Chicas. Tarija is the capital of this place. Its soil produces a quantity of corn, oil, grapes, and other fruits.

PARAGUAY.

As the subdivisions of this great province are very imperfectly known, we shall describe them in a more general manner than we have done the places preceding.

Nature of the Country. Paraguay takes its name from the great river Paraguay, as the province called Rio de la Plata does from the lower part of the same river, that takes, a little above Buenos Ayres, this name, which is equivalent to that of the river of silver. It was so called by the Spaniards who first proceeded up it, probably because they found some spangles of silver mixed amongst the sand. Several geographers have asserted, that there are mines of gold and silver in the environs of the river; but it would be difficult to prove what they have advanced. It is, however, certain, that Paraguay produces neither iron nor copper. The Jesuits have declared this to be the case; and their assertion is confirmed by Helms.

The upper part of the country, which lies along the rivers of Paraguay, Pilcomayo, and Vermejo, consists of fine plains, watered by a great number of rivulets, agreeable hills, and thick forests; but the lower part contains a series of barren or swampy countries, in which there are saline plains. To the east of Parana, the ground is hilly.

Vegetable Productions. Without mentioning either the maize, which the Indians, who have submitted to the Spaniards, use generally for making bread, or the manioc and yuca, roots from which they prepare another sort of bread, which is very useful for travellers, as it will keep a long while, all the sorts of grain and pulse which the Spaniards have introduced in Paraguay grow with astonishing success. There are, indeed, but very few vines, either because the soil is not fit for them, or

perhaps because the missionaries have prevented them from being generally introduced, in order to check the outrages which generally follow the use of wine. Instead of this liquor, the Indians drink, at their festivals, a kind of beer, which is nothing more than water in which they have left to ferment for two or three days some maize flour, the seed of which has been steeped in water, and allowed to germinate, after which it is dried and ground. This liquor is capable of inebriating the drinker: it is called *chica* or *ciccia*; and the Indians think that nothing can be more delicious. It is said, that the chica is more agreeable to the palate than cyder, and more light and wholesome than the beer of Europe; that it increases the animal spirits, and induces pinguefaction.

There may be seen at Paraguay, particularly in all the isles, a multitude of birds of various kinds, amongst which are parroquets; they do great injury to the maize-fields of the Indians, as they are particularly fond of that sort of grain.

Paraguay produces, according to the missionaries, all the species of trees which are known in Europe. In some parts may be seen the famous Brazil-tree, though it is much more common in the vast and fine country after which it is named: there also grow, in almost every direction, an inconceivable number of those shrubs which bear cotton, and which form one of the principal sources of opulence in this part of the country. Sugar-canes grow spontaneously in moist places, but the Indians do not make any use of them.

A tree which is much esteemed, and which abounds in Paraguay, is that from which is derived the liquor called dragon's blood. There are several other useful resins; and it is not uncommon to meet in the woods with wild cinnamon, which is sometimes sold in Europe for that of Ceylon. Rhubarb, vanilla, and chochineal, are also amongst the natural productions of this country.

Paraguay also produces several singular fruits, which the missionaries have but vaguely described. One of these resembles a bunch of grapes, but each grape or pip of which is nearly as small as a pepper-corn. This fruit, which is called *imbegue*, has a very agreeable taste and smell. Each grape of the bunch contains only a single seed, which is as small as that of millet, and which, when cracked in the mouth, is more pungent than pepper. The fruit just described is generally eaten after dinner, or even after other meals; and according to the quantity taken into the stomach, an easy and gentle evacuation is produced in a certain length of time.

The *pigna*, another fruit of this country, bears some resemblance to the pine-apple: on which account the name of pine

has been given to the tree which produces it. The figure of the pigna, however, approaches more towards that of the artichoke; its yellow pulp is like that of the quince, but is much superior to it both in smell and taste.

The *tea*, or herb of Paraguay, so celebrated in South America, is the leaf of a species of ilex, about the size of a middling pear-tree. Its taste is similar to that of the mallow; and its shape is nearly like the leaf of the orange-tree: it also bears some resemblance to the cocoa of Peru, whither much of it is conveyed, but particularly to the parts which contain the mines, where it is consumed by the labourers. The Spaniards think it to be the more necessary, because the wines in those parts of the country are prejudicial to health. It is conveyed in a dry state, and almost reduced to a powder, and it is drunk as an infusion.

The great harvest of this herb takes place near new *Villarica*, which is contiguous to the mountains of Maracayu, situated to the east of Paraguay, in about 20 deg. 25 min. S. lat. This canton is much esteemed for the culture of the tree, but it is found in the marshy vallies which separate the mountains, and not on those elevations themselves.

Of this plant there are sent to Peru alone about 100,000 parcels, called arrobes, each weighing 25lbs. of 16 oz. to the pound; and the price of the arrobe is equal to twenty-eight French livres, or 1*l*. 3*s*. 4*d*. sterling; which makes the total value of this merchandize sent to Peru, 116,666*l*. 13*s*. 4*d*.

The Indians who reside in the provinces of Uraguay and Parana, under the government of the Jesuits, have sown seeds of this tree, and transplanted them to Maracayu, where they have not degenerated; they resemble those of the ivy.

The people boast of innumerable virtues which this tree possesses: it is certainly apperient and diuretic; but the other qualities attributed to it are doubtful. The *Chapetons*, or European Spaniards, do not make much use of this drink; but the Creoles are passionately fond of it, in so much that they never travel without a supply of the herb: they never fail to drink an infusion of it at every meal, preferring it to all sorts of food, and never eating till they have taken this favourite beverage. Instead, however, of drinking it separately, as we drink tea in Europe, they put the plant in a calabash, mounted with silver, which they call *maté*. They add sugar to it, and pour on it hot water, which they drink off directly without waiting for a maceration, because the liquor would then become as black as ink. In order not to swallow the fragments of the plant which swim at the surface, they use a silver pipe, the top of which is perforated into a number of small holes, through which they suck the liquor without drawing in the plant. A whole party is supplied with

the tea by handing round the same pipe and bowl from one to another, and filling up the vessel with water as fast as it is drunk out. The repugnance of Europeans to drink after all sorts of people, in a country where syphilitic diseases are very prevalent, has caused the introduction of small glass pipes, which had begun to get into use at Lima in the time of Frezier.

"The commerce carried on in this herb from Paraguay," says the author just mentioned, "takes place at Santa Fé, where it arrives by the river La Plata, as well as in waggons. There are," he observes, "two sorts, one called *Yerva de Palos*, and the other, which is finer and of a superior quality, is denominated *Hierba de Camini*. This last is grown on the lands of the Jesuits. There are every year sent from Paraguay to Peru, upwards of 50,000 arrobes, or 1,250,000lbs. of both sorts, of which one third is of the Camini kind, without reckoning about 25,000 arrobes of that growth at Palos, which is sent to Chili."

ANIMALS. The animals peculiar to the whole of Spanish America, are all to be met with in Paraguay. The *Jaguars*, *Couguars*, and other wild beasts and serpents, seldom hurt those who attack them: much more injurious, however, are the ants and apes; for the former, which are more numerous in Paraguay than any where else, devour the tender plants of all sorts, and prevent them from coming to perfection; while the apes ravage the country, rob the trees of their fruit, and commit extensive depredations in the corn-fields. Some of these animals are almost as big as men, and several of the hordes of Indians kill and eat them, not merely without repugnance, but with pleasure.

The inhabitants of Paraguay are said to possess an excellent antidote against the bite of serpents, in a plant which, for this reason, is called *viper-grass*: its virtue is so great, that, on being macerated while green, and applied to the bitten part, it effects a rapid cure. The water in which this herb, whether green or dry, has been infused, is not less salutary. The only account which we have of this plant has been given by the missionaries; and it is much to be regretted that they have furnished us with no other particulars of it than above-mentioned.

TOWNS. The state of the towns in Paraguay is but little known. *Assuncion*, in English *Assumption*, is the capital of the province; it is situated 840 miles from Buenos Ayres, on the river of Paraguay. Though the residence of a bishop and a governor, it is but thinly inhabited.

NEEMOUCOU is a pretty town, situated, according to M. d'Azzara, in 25 deg. 52 min. 24 sec. S. lat. and 99 miles from the town of Assumption. Courougnati, another town mentioned by d'Azzara, is 108 miles E. N. E. of Assumption.

OF THE ESTABLISHMENTS OF THE JESUITS IN PARAGUAY.

The first enterprises of the missionaries, who penetrated to the then unknown centre of South America, were limited to simple excursions. They converted, from time to time, a few Indians; but there were no great number of Christians, and there was not a single church in Paraguay built to the honour of the true God. The principal and almost unique advantage then derived from their labours, was that of the baptism of a few infants in a dying condition; they, however, drew from amongst the infidels such adults as embraced the faith, and induced them to reside on the lands occupied by the Christians.

Between the years 1680 and 1690, these fathers represented to the court of Spain, that the slow success of their missions ought to be attributed to the scandal which the immorality of the Spaniards had excited, and to the hatred with which their insolence had inspired the Indians wherever they had shewn themselves. They insinuated that, without this obstacle, the empire of Christianity would be, by their efforts, extended to the most unknown parts of America; and that all those countries might be brought under the dominion of his Catholic Majesty, without expence or effusion of blood. It must be clear, that this opinion of the Jesuits was rational; for how could savage people be civilized, who were courageous and intelligent, when they were subjected to the avidity of a few unprincipled merchants, who went amongst them for the purposes of plunder? The outrages committed towards the Indians by those adventurers have been recently proved by Mackenzie, and other well-informed travellers.

The demand of the Jesuits was just and reasonable, and it was attended with success. The theatre on which they were to appear, was pointed out to them; and they had a carte blanche for the whole extent of the territory. The governors of the adjacent provinces were forbidden to interrupt them, and they were commanded not to let any Spaniard enter their districts without the permission of the fathers.

At first they collected a very small number of families on the banks of the Uraguay; afterwards they penetrated into the country called Guayra, where they established themselves in the vicinity of the great river Parana, and on the banks of the smaller ones of Tibagi and Guichay. The Portuguese of St. Paul, in Brasil, destroyed this rising republic; and the missionaries saved themselves, with about 12,000 Indians; when they retreated, with much discernment, to the part where Parana and the Uraguay, on forming two opposite bends, approach each other with their

respective streams. San Ignacio and Loreto were their two first *poblacions* or towns. Here they laid those slight foundations on which they raised an edifice that astonished the whole world, and which added so much glory to their society as to excite the envy and jealousy of other powers.

The Jesuits laboured with so much incessant zeal, and such judicious policy, that they softened the manners of the most savage nations; caused those hordes most inclined to a wandering life to settle; and brought under their government those who had long resisted the arms of the Spaniards and Portuguese. They gained thousands of families over to their religion, and those soon induced others to follow their example, by representing the tranquillity which they enjoyed under the influence of those holy fathers. The *Guaranis* were the most numerous and most powerful of the converted nations; and theirs became the predominant language.

We have not room to detail all the means which were employed to subjugate so completely the body and mind of so many individuals. The Jesuits omitted nothing that could insure the success of their mission; while they made every effort to increase the number of their adherents, so as to form a strong and well regulated society. The Indians, who were convinced of their better condition by being able to subsist by agriculture, lodged in a more salubrious manner, more properly clothed, cured of their diseases, and governed with a mild degree of strictness, exhibited such obedience and submission as resembled adoration; and this striking success had been obtained by the Jesuits without violence, or even constraint. It is added, that they caused the Indians to be instructed in the military art; that they accustomed them to the most exact discipline; and that the army which they could form amounted to 60,000 well equipped men. These, however, are the exaggerations dictated by envy. The Indians resided in the towns and villages, where they devoted themselves to agriculture and manufactures; and many of them even aspired to the liberal arts. Nothing, in short, could equal the obedience of the inhabitants of this province, except their content.

Several writers have treated these very Jesuits with much severity, by accusing them of ambition, pride, and abuse of power, for having caused to be whipped before them not only persons of both sexes, but even the magistrates, whom the Indians had chosen from amongst themselves, and suffering persons of the highest condition in their districts to kiss the ends of their garments, which they considered as an honour. The Jesuits were also said, by their enemies, to possess immense property; that all the manufactures belonged to them; that the natural produc-

tions of the country were brought to them; and that the treasures annually transmitted to the superior proved, that their zeal for religion was not the only motive for the missions.

The fathers, however, contented themselves with a mild refutation of such calumnies. They merely asked, where were the pretended gold mines which afforded them such riches? how it could be possible to conceal so much gold? and whether any missionary was ever seen in an equipage proper for a rich man? On the contrary, when they travelled from one country to another, they never had any thing but a pair of bags, or a small box, which held their linen and provisions. And finally, whether, after their death, any of them were found to possess gold, silver, bills of credit, or other property of value?

Hence it appears, that a just political economy was the only source of the prosperity of the religious colonies. For a long time the Indians were accustomed to send to the towns of the Spaniards whatever overplus they had of cotton, tobacco, tea, hides, &c. and all these effects were placed in the hands of the procurator-general of the Jesuit missionaries. This officer sold or exchanged them to as much advantage as possible, and after giving an exact account of the produce, and deducting the duties or tribute, he employed the remainder in purchasing articles of utility or necessity for the Indians, without retaining any thing for himself.

The Indians belonging to the missions were free people, who were placed under the protection of the king of Spain, and who agreed to pay an annual tribute of a dollar per head. The king had granted them certain privileges, in virtue of which all the women, the men below twenty years of age, and above fifty, as well as those who had lately embraced Christianity, were exempted from the payment of the tribute; but, on the other hand, they were obliged, in time of war, to join the Spanish armies, to arm themselves at their own expence, and to work at the fortifications. They rendered great services to Spain in the war against the Portuguese.

Notwithstanding such sacred compacts, the monarchs of Europe made no scruple to treat these Christian people like a horde of wild beasts. In 1757, a part of the territory of the missions was ceded by Spain to the court of Portugal, in exchange for Santo Sacramento, in order that the limits of the possessions of the kingdoms might be better defined. It is asserted, that the Jesuits refused to submit to this division, or to suffer themselves to be transferred from one master to another without their own consent. The Indians, according to the accounts in the London Gazette, took up arms, but were easily defeated with great slaughter by the European troops who were sent to subdue them.

The suddenness of this defeat proves, that they had neither union amongst themselves, nor chiefs to direct them, and consequently that the Jesuits were not concerned in their operation. In 1767, these fathers were driven from America, by order of the king, and their unfortunate converts degraded to the same footing as the other indigenous inhabitants of the country.

It is very evident that the hatred of a few Spaniards towards the Indians belonging to the missions was so great, that, as Father Aguilar states in his justificatory memoir, "they wished to force those Indians to submit, not merely to the king of Spain, but also to every Spaniard individually, as well as to the valets and slaves of the Spanish subjects; and if a Spaniard of a mongrel breed, or even more degraded than that, saw an Indian who did not humble himself before him, or submit to his caprices, he became exasperated against him, and abused him in the most virulent manner for his want of respect."

Hence the self-called *French philosophers*, by declaiming against the Jesuit missionaries, made a common cause with the tyrants of Paraguay, at the very time when they were preaching up the necessity of giving freedom to the negroes in the Antilles. Ten years afterwards these same philosophers, with Voltaire at their head, distributed their flattery and adoration to the monarchs who divided Poland.

OF THE MANNERS OF THE ABIPONS, AND SOME OTHER SAVAGE NATIONS.

The Abipons inhabit the province of Buenos Ayres. We shall give a sketch of their manners, as it is in some degree connected with what has been said of the missions.

This warlike tribe consists of about 5000 souls: they inhabit a part of the country called Yapizlaga, between the 28th and 30th degree of latitude, on the banks of the river of La Plata. They breed horses, and train up wild ones. Their arms are lances, about three or four yards long, and arrows which are sometimes pointed with iron. Their warlike spirit has rendered them formidable to the Spaniards; and the missionaries have had but little success amongst them. The blood of this nation is tolerably pure; and the women are not much browner than the Spanish females. The features of the men are regular; and the aquiline nose is very common amongst them. They have a custom of tearing the hair away from the forehead so as to appear bald, which has acquired them the name of *Callegas* amongst the Spaniards. They also tear out the beard, and mark the forehead and temples with scars by way of ornaments. They are very cleanly, and frequently bathe: they are

not anthropophagi, as has been said of some of their neighbours; but they have a voracity which is common with all savage people. They said to the missionaries, "*if you wish us to remain amongst you, you must give us plenty to eat; for we resemble the beasts, which eat at all hours, and are not like you, who eat but little and at certain periods.*" In fact, the Indians regulate themselves in this respect not by the clock, but by their appetite, which is always increasing.

Polygamy does not appear to be a general practice among them; but some of the women adopt the barbarous custom of killing their children after having suckled them, in order to bestow all their attention upon their husbands. The common age at which they marry is from twenty to twenty-five years. The girls are bought from their parents at the price of four horses, and a few clothes made of pieces of cloth of different colours, so that they resemble in some degree a Turkey carpet.

It has been asserted, that they have no idea of a Supreme Being, but that they are much in dread of a certain dæmon, or evil spirit; and that they have amongst them magicians, called *Kivet*, to whom they attribute the power of appeasing this disturber. But it is probable that this evil spirit is considered by them as the Supreme Being, to whom they only pay a sort of worship when they think him angry. The Abipons generally bury their dead under the shade of a tree; and when a chief or warrior dies, they kill his horses on his grave. Some time afterwards they dig up his remains, and convey them to a more secret and distant place.

Their opinion of another life is evident by the care which they take, on burying their dead, to inter with them provisions, and a bow and arrows, in order that they may procure themselves a subsistence in the other world; and that hunger may not induce them to return to this, to torment the living.

The Mocobs and the Tobas, to the north-west of the Abipons, speak nearly the same idiom; but the language of the Guaranians is the most extensive.

The caciques of this people are nothing more than chiefs in case of war, and judges in time of peace: their power is very limited. The little republics, or hordes of Indians, disperse with the same facility as they collect together. Each man being his own master, they separate as soon as they are discontented with the cacique, and place themselves under another; and when they quit any place, they have so little to leave behind them, that they easily, and in a short time, repair their loss.

If we may believe some of the ancient missionaries, there are amongst the caciques *magicians*, who render their authority respected by the sorcery which they employ in secret against

those with whom they are discontented. If they were to punish them publicly by the regular means of justice, they would defeat their own object; and hence these impostors make the people believe, that tigers and tempests are under their command, to devour or destroy whoever refuses to obey them. The people believe them with the more readiness, because it is not unusual to see those whom the cacique has threatened, waste away and perish, doubtlessly because poison has been administered to them in secret.

The *Manacicas*, who are more industrious and richer than the other tribes of Paraguay, live under a government whose customs resemble, in a striking manner, those of the islanders of the Pacific Ocean. The cacique amongst them possesses the sovereign authority; his lands are cultivated, and his houses built at the expence of the public. His table is always covered with the best produce of the country, and is supplied free of expence. No considerable undertaking can be ventured on without his permission; he punishes severely those who are guilty of any offence, and ill treats with impunity, and according to his caprice, those with whom he is discontented. The women are in the same manner submitted to the will of the principal wife of the cacique. All the individuals of the horde pay him a tithe of the produce of their hunting and fishing; and they can neither catch animals nor fish without his permission. His authority is, besides, not merely absolute, but hereditary: as soon as the eldest son is at an age to command, his father makes over his authority to him with much ceremony; and this voluntary renunciation only increases the love and respect of the people for their old master.

The mythology of the Manacicas seems to possess some traits of similarity with that of the Taitians. They admit three Supreme Beings, one of whom is a goddess, who, according to their doctrine, is the wife of the first, and the mother of the second: they call the latter *Urasana*, and the goddess is named *Quipoci*. These deities are said to shew themselves from time to time in dreadful forms to the Indians, who assemble on certain occasions in the hall of the cacique to drink and dance. Their arrival is announced by a great noise, and as soon as they appear, the people cease their diversions, and put forth shouts of joy. The gods then address them with an exhortation to eat and drink well, and promise them an abundance of fish, game, and other valuable property: they then, to do honour to the feast, demand something to drink, and empty the goblet which is presented to them, with a quickness which would confer credit on the deities of Valhalla itself. It may easily be guessed that the priests or *Maponos* are behind the curtain.

These jugglers also act as oracles: they announce scarcity or abundance, storms or fine weather; they often excite wars, and never fail to demand for their gods a portion of the spoil.

The Manacicas believe that the human soul is immortal, and that, on leaving the body, it is carried to heaven by the Maponos, to live eternally in joy and pleasure. As soon as an Indian dies, the Mapono disappears for a certain time, during which, he states, that he is employed in conducting the soul of the deceased to the regions of felicity; his journey is always conceived to be very difficult, as he has to pass through thick forests, and over rude and steep mountains; he has also to cross a great river, on which is a wooden bridge, guarded night and day by the god *Tatutiso*. This divinity is not a bad resemblance of Charon: his employment is, to purify the souls of all the spots that they have received while alive. If a priest, who brings a soul, be not properly respectful towards this deity, he precipitates him into the river, and leaves him to drown. At length the soul arrives at Paradise; but the Paradise of the Indians is only a poor one, for its pleasures are not very attractive. There is nothing to be found in it but a kind of gum, with honey and fish, on which the Indian souls are fed. The Mapono, on his return, relates a thousand other absurdities concerning his journey, and never fails to get well paid for his trouble.

The small-pox commits as many ravages among the Indian hordes, as the plague does amongst us, where it is brought from the Levant. As soon as the Indians perceive that any one is attacked with this contagious disease, which generally proves mortal in Paraguay, they abandon their habitations, and retire in haste into the woods, after putting near the sick person provisions sufficient to last him three or four days, and from time to time somebody returns to renew the supply, till the patient be either dead or cured.

Father Guëtan Cattanéo has described the manner in which father Ximenes saw the Indians fight with a jaguar, or American tiger. This missionary was travelling with three Indians, when they observed the tiger enter a small wood or coppice, and resolved to go and kill it. The father concealed himself in a place from which he could observe, without danger, all that passed. The Indians, who were accustomed to this kind of hunting and combat, arranged themselves as follows: two of them were armed with lances, and the third, who carried a musket, placed himself between the others; they then advanced all abreast, and walked round the coppice till they saw the tiger, when the man with the gun fired, and shot the animal in the head. Father Ximenes asserts, that, at the same instant when the ball was fired, he saw the tiger transfixed by the two lances; for as soon

as the beast felt itself wounded, it darted forwards upon the person who had shot it. The two other Indians having a presentiment of what would happen, held their lances ready to stop the animal in its course; in fact, they pierced it in the flanks with admirable skill, and in an instant held it suspended in the air.

PROVINCE OF BUENOS AYRES.

This province, which is sometimes called after the Rio de La Plata, comprises a vast space of territory on the banks of the great river of La Plata. The eastern part is crossed by the Uraguay, and it contains a number of mountains, particularly in the interior: the other part is an immense plain, which extends to the bases of the Andes, and is in many parts impregnated with salt and nitre.

Rivers. The river La Plata is formed by the junction of several large streams, among which the Parana is by far the largest, on which account the natives give this name to the aggregate rivers. The name of La Plata was bestowed on it by the Spaniards.

The Parana proceeds from the environs of Villa del Carmen to the north of Rio de Janeiro, and is greatly augmented in its course by a number of other streams. It flows through a mountainous country, and after reaching the large plains, receives from the north the Paraguay, which originates in a plain called Campos-Paresis; and which, during the rainy season, forms the lake of Xarayes. The Paraguay, before it disembogues itself into the Parana, receives the Pilcomayo, a large river, which has its source near Potosi, and by which the inland navigation from the mines is carried on.

The Plata also receives the Vermego and the Salado, from the side of the Andes, and the Uraguay from the side of Brazil. In breadth, it equals that of the Amazons, and is navigable by vessels even to the distance of 400 leagues from its mouth. The great cataract of Parana is situated in the 24th degree of latitude, not far from the city of Guayra; but this cataract, according to the account of Dobrizhaser, ought rather to be termed a long rapid river, since the water, for the space of twelve leagues, falls over rocks of a very singular and frightful form.

Besides the great river just described, it is necessary to mention the Uraguay, a river which surpasses either the Rhine or the Elbe.

At its mouth the eye can scarcely perceive both the banks at one time, and at 200 leagues higher up it requires an hour to cross it. It is full of fish, and is frequented by sea-wolves; its

bed is interspersed with rocks, and its course is interrupted by several rapids. The rivers to the west of La Plata, mostly lose themselves in the marshes or sandy plains.

WINDS. The west wind is here called the *Pampero*, because it passes over a plain 300 leagues long, which is denominated Las Pampas, and inhabited by hordes of migratory Indians, known in that country by the name of Pampas. This plain extends from Buenos Ayres to the confines of Chili: it is perfectly level, and covered with very high grass. The Pampero not meeting with any thing in its course to check its impetuosity, acquires additional strength, till, by running straight along the channel of the river of La Plata, it blows with such fury, that ships, in order to withstand it, are obliged to throw out all their anchors, and strengthen their cables with strong chains of iron. Their approach is indicated by violent thunder and lightning.

CLIMATE. The winter begins in June, when it rains much, and the thunder and lightning are so violent, that nothing but custom can prevent one from being terrified at such a period. The great heat of summer is tempered in these regions by a breeze, which is felt towards noon.

PRODUCTIONS. In the plains there is a scarcity of wood; but to counteract this want, there is a vast extent of land fit for the purposes of agriculture. The soil is sandy, with a mixture of black mould. The nature of the mountains on the upper Uraguay, is not known. Helms asserts, that a silver mine has been discovered in them: they produce an abundance of medicinal plants, but no precise description has been given of them. On the side of Monte-Video and Buenos Ayres, all sorts of fruits are obtained, and particularly the *durasno*, a very delicate fruit, the tree of which is nearly similar to the European peach-tree, except that its trunk is much larger. The trees which produce this fruit are so numerous in the province in question, that they afford the only wood that is used for fuel; notwithstanding which, no diminution is apparent amongst them. The oxen and horses are found in such numbers, that they require only to be taken by means of a noose, as is done by the Cossacks of the Don, and the peasants of some parts of Italy. There are also wild birds and animals of every species, and particularly jaguars, which are larger here than any where else. The animal called here *hormiguero*, which lives upon nothing but ants, is quite common in the Pampas: it has a very long and pointed muzzle.

WILD OXEN. The number of wild oxen here is so great, that every year 100,000 are killed solely for the sake of their hides. About twenty hunters on horseback proceed to the spots

where these animals are known to herd, having in their hands a long stick, shod with iron, very sharp, with which they strike the ox that they pursue on one of the hind legs, and they make the blow so adroitly, that they almost always cut the sinews in two above the joint. The animal soon afterwards falls, and cannot rise again. The hunters, instead of stopping, pursue the other oxen at full gallop, with the reins loose, striking in the same manner all which they overtake; thus eighteen or twenty men will with ease fell 7 or 800 oxen in one hour. When they are tired of the exercise, they dismount to rest, and afterwards, without danger, knock on the head the oxen which they have wounded. After taking the skin, and sometimes the tongue and suet, they leave the rest for the birds of prey.

Wild Dogs. These animals have descended from some of the domestic kinds that have gone astray, and have multiplied to an excessive degree in the countries near Buenos Ayres. They live under ground, in holes, which may be easily discovered by the quantity of bones heaped round them. It may be with propriety supposed, that some time or another, when the wild oxen are destroyed, so that the dogs cannot obtain them, they will fall upon men. One of the governors of Buenos Ayres thought this subject so well worth his attention, that he sent some soldiers to destroy the wild dogs, and they killed a great number of them with their muskets. But on their return, they were insulted by the children of the town, who are very insolent; they called them *mataperros*, which means, dog-killers: whence it has happened that the men, disheartened by a false shame, have never returned to that kind of hunting.

Horses. The horses of Buenos Ayres are excellent; they possess all the spirit of the Spanish horses, from which they have descended, have an uncommonly safe foot, and are surprisingly agile. Their walk is so quick, and their steps so long, that at this pace they equal the trotting of the horses in France. Their step consists in raising exactly, and at the same instant, the fore and hind foot, and instead of putting the latter at the spot where they had just rested the opposite fore foot, they carry it much farther, which renders their motion nearly double as rapid as that of horses in general, while it is much more easy for the rider. They are not distinguishable for their beauty, but their lightness, gentleness, courage, and regularity, may be boasted of. The inhabitants make no provisions, either of hay or straw, for the support of these animals, the mildness of the climate allowing them to graze in the fields all the year round.

TOWNS.

BUENOS AYRES, the capital of the whole province of the river La Plata, is situated 210 miles from its mouth, in 69 deg. 10 min. W. lon. and 34 deg. 35 min. S. lat. Its site is very handsome. From the north side may be seen the river, the width of which is beyond the reach of the eye. The environs consist of nothing but extensive and beautiful fields, always covered with verdure.

The port of Buenos Ayres is always exposed to the winds, on account of which vessels cannot approach very near to the town; while the boats or small craft which go to it, are obliged to make a *detour*, and enter a stream which empties itself into the main river; the water in this is two or three fathoms deep; but when the tide has ebbed in the great river, the branch in question cannot be entered.

Buenos Ayres is the residence of a viceroy and a bishop. It is supposed to contain 3000 houses and 40,000 inhabitants*. This city is now the grand emporium of all the commerce of the provinces of Peru; and the goods are conveyed thither in waggons drawn by horses. The conductors travel in caravans, on account of the Pampas Indians, who are very troublesome to travellers. This city is watered by several large rivers, all of which empty themselves into that of La Plata. It has a fine square surrounded with superb buildings, and a fortress on the river, which is the residence of the governor. The streets are perfectly regular, with foot-paths on each side.

The immense country which constitutes the province of Buenos Ayres, was formerly subject to the viceroy of Peru; but in 1778, it was erected into a separate government, which includes the greater part of the country adjacent to Peru.

Formerly the citizens of Buenos Ayres had no country-houses; and except peaches, none of the finer sorts of fruits were produced there. At present, there are few persons of opulence but have villas, and cultivate in their gardens all kinds of fruit, culinary plants, and flowers. The houses are in general not very nigh; but most of them are built in a light and beautiful manner.

At Buenos Ayres, the men as well as the women dress after the Spanish mode, and all the fashions are brought thither from the mother country. The ladies in Buenos Ayres are reckoned the most agreeable and handsome of all South America.

* Sir Home Popham, in his circular letter to the British merchants, estimates the number of inhabitants at 70,000, and Helms at only 25 or 30,000.

Until the year 1747, no regular post was established either in Buenos Ayres, or the whole province of Tucuman, notwithstanding the great intercourse and trade with the neighbouring provinces; but, in 1748, the Viceroy Don Andonaegui instituted regular posts.

Buenos Ayres is well supplied with provisions; of fresh meat in particular there is so great an abundance, that it is frequently distributed gratis to the poor. The river water is rather muddy, but it soon becomes clear and drinkable, by being kept in large tubs of earthen vessels. Of fish, too, there is great abundance.

Neither in the district of Buenos Ayres, nor in Tucuman, does any snow ever fall: sometimes it freezes a little, so as to cover the water with a thin coating of ice, which is collected and preserved with great care, for the purpose of cooling their liquors.

That the climate of Buenos Ayres is very salubrious, appears from the proportion of the births to the deaths; and consequently the city has not been improperly named. In June, July, August, and September, however, fogs arise from the river, which affect the lungs and breast. The vehement winds too, which blow from the pampas, or plains, and are therefore called *Pamperos*, prove very troublesome to the inhabitants.

Monte-Video. This is a town on the river of La Plata, about sixty miles from its mouth. It has a large and convenient harbour, and the climate is mild and agreeable. The markets are plentifully supplied with fish and meat at a very cheap rate. Its principal trade is in leather. It is 150 miles from Buenos Ayres, to which you may pass by land or water, and in 34. deg. 56 min. 9. sec. S. latitude.

San-Sacramento. This is a town opposite Buenos Ayres: it was founded by the Portuguese, about ninety miles from Monte-Video, and was ceded to Spain in 1778.

Santa-Fe is a middling-sized town, about 240 miles from Buenos Ayres.

Manners of the Spaniards. Don Pernetti has given a curious picture of the Spaniards of Monte-Video. To sleep, talk, smoke a segar, and ride on horseback, are the occupations in which they pass three-fourths of the day. The great abundance of provisions gives facility to their idleness, besides which, there are amongst them many persons of property, so that they all appear anxious to live in style, and have nothing to do.

The women during the whole of the morning sit on stools in their entrance halls, having under their feet, first, a cane mat, and over that a piece of the stuff made by the Indians, or a tiger's skin. They amuse themselves with playing on a guitar,

or some similar instrument, which they accompany with their voice, while the negresses prepare the dinner.

In these countries jealousy does not disturb either sex. The men publicly acknowledge their illegitimate children, who become the heirs of their fathers. There is no shame attached to bastardy; because the laws so far authorize promiscuous intercourse, as to grant to the children which result from it the title of gentlefolks.

The women, though covered by a veil in public places, live at home with as much freedom, to say the least of it, as females do in France; they receive company as they do in France; and do not suffer themselves to be pressed to dance, sing, or play on the harp, guitar, or mandoline. In this respect they are much more complaisant than French women, if we may credit the assertion of Don Pernetti. When they are not occupied in dancing, they sit continually on the stools already mentioned, which they sometimes place outside the door. The men are not allowed to sit among them, unless they are invited, and such a favour is considered as a great familiarity.

At Monte-Video, a lively and very lascivious dance is much practised; it is called *calenda,* and the negroes, as well as the mulattoes, whose constitutions are sanguine, are excessively fond of it. This dance was introduced into America by the negroes who were imported from the kingdom of Ardra, on the coast of Guinea, and the Spaniards have adopted it in all their establishments. It is, however, so indecent as to shock and astonish those who are not in the habit of seeing it performed. The accounts which have been given of this licentious recreation are so different from what is conceived in Europe, that a particular detail of them would resemble a story of La Fontaine, rather than a matter of fact.

The common people, in which are included the mulattoes and negroes, wear, instead of a cloak, a piece of stuff, in stripes of different colours, which appears like a sack, having only a hole at top for the admission of the head; it hangs over the arms down to the wrist, and reaches, both before and behind, down to the calf of the leg; it is fringed all round at the bottom. The men of every class wear it when they ride on horseback, and find it much more convenient than the common cloak. The governor shewed one of these habiliments to Messrs. Bougainville, Pernetti, &c. which was embroidered with gold and silver, and had cost him upwards of 300 piastres. The same dresses are made at Chili, in such a style as to cost 2000; and it is from that country that they have been imported at Monte-Video. This dress is known by the name of *poncho* or *chony:* it secures the wearer from rain, is not ruffled by the wind, and not only

serves him for a coverlet at night, but also for a carpet when he rests in the fields.

PROVINCE OF TUCUMAN.

THIS province extends along the Andes, opposite to Chili, which it separates from Paraguay and Buenos Ayres. It is situated between the 3d and 24th parallel of S. latitude.

ACCOUNT OF THE SOIL, MOUNTAINS, AND RIVERS.

The ramifications of the Andes extend along the northern part of this province, in consequence of which its climate is very cold. The southern part is nothing but a vast plain; and it appears that the whole of Tucuman is formed of low grounds: for several rivers, when they reach it, not being able to pass onwards to the sea, form lakes in different parts. This country bears a strong resemblance to Tartary and Little Bucharia. The two principal rivers of Tucuman are the *Rio Salado*, which, after passing through a swampy country, joins the river of *La Plata* and the *Rio Dolce*, which empties itself into the lake of *Porongas*. The valley of Palcipas, which runs between two branches of the Andes, gives passage to a considerable river, which empties itself into a lake: all the rivers of the province of Cordova run into sandy plains, except the *Tercero*, which empties itself into La Plata.

CLIMATE. The climate of Tucuman is in winter very cold and dry. The spring is announced by violent rains; and the heat of summer is great and sudden. This temperature, which is natural in a country surrounded by high mountains, is not agreeable, but the people are accustomed to it, and Tucuman is considered to be an uncommonly salubrious country. The environs of the lakes and marshes ought, however, to be excepted.

PRODUCTIONS. In the parts where the plains are fertilized by rivers, the country is covered with excellent pasturage, and every year they afford an abundant produce of oxen, sheep, stags, and other cattle. Game is so abundant, that it is met with at almost every step, and the animals are frequently taken by the hand. Pigeons and partridges are uncommonly numerous, though it must be admitted, that they are not so good as those of Europe. Maize, vines, cotton, and indigo, are cultivated with great success; and the forests between the Rio Dolce and the Salade contain immense quantities of bees.

There are said to be in Tucuman two mines of gold, one of silver, two of copper, and two of lead; the people manufacture

a quantity of woollen and cotton stuffs; and a fine mine of rock salt has lately been discovered.

Towns. The principal towns in this province are the *Salta of Tucuman*, which is the residence of a governor, and is situated in a very fertile valley; Jujui, Rioja, San-Fernando, Saint-Jacques de l'Esterro, San-Miguel, and Cordova, the last of which is the residence of a bishop, and the best town in the province. The fathers of the company of Jesus had a celebrated university at Cordova, where the young Spaniards of South America were sent to be instructed in the sciences. There are several other colonies of Spaniards dispersed through the immense plains of Tucuman, which take the name of towns, though the inhabitants are not numerous. It is said that they are from 150 to 180 miles distant from each other; and the roads which lead to them, are so difficult and barren as sometimes to require twenty days to travel from one to the other; and even the environs of the towns are said to be so irregular or uneven, that a corregidor belonging to one of them, who was riding in his carriage, had one of his eyes knocked out by the branch of a tree, which entered the coach window.

ACCOUNT OF THE VICEROYALTY OF CHILI.

THE following description relates to what is commonly called the *kingdom of Chili*; which is *Chili proper*, that lies to the west of Andes, as well as *New Chili*, and the province of *Cuyo*, to the east of those mountains.

It has already been observed, that Cuyo and New Chili are dependant on the viceroyalty of La Plata; while the presidency of St. Jago only includes Chili proper. But the judiciary and ecclesiastical division of those places is very different from those of the other governments and vice-royalties.

Situation and Extent. Chili proper lies on the shore of the Pacific Ocean, between the 23d and 45th deg. of S. lat. and the 304th and 308th deg. of lon. to the east of the first meridian of the isle of Ferro. Its length from north to south is between 1500 and 1650 miles; and its width from east to west about 240 miles, which comprises the chain of the Andes. It is bounded to the west by the Pacific Ocean; to the north by Peru; to the east by Tucuman; and to the south by the countries of Magellan. It is separated from all these regions by the Andes.

The province of Cuyo lies between Chili and Tucuman,

from the 30th to 35th parallel of latitude. New Chili extends indefinitely to the south of the province of Cuyo, towards the Pampas of Buenos Ayres, and the deserts of Patagonia.

CLIMATE. This kingdom is one of the first in all America. Its climate is temperate and salubrious; its soil is fertile, and it always has a clear sky. Its seasons are regular; the spring, for example, commences in September; the summer, in December; the autumn in March, and the winter in June. At the commencement of the spring there are abundant falls of rain, but seldom or ever in the other seasons. The summer is serene, and passes without storms or tempests. The want of rain does no injury to the country: for the moisture that is absorbed from the heavy falls in spring, and the abundance of dew which descends every night in summer, are sufficient for fructification. The summer season in these parts would be insupportably hot, if the air were not cooled by the wind which blows from the sea, as well as by that which comes from the Andes, the summits of which are always covered with snow. The cold of winter is very moderate, insomuch that snow is scarcely ever known to fall in the maritime provinces; and it is not seen once in five years in those which are contiguous to the Andes.

METALS. There are in Chili mines of every metal, semi-metal, and mineral, which has hitherto been discovered; and gold in particular abounds there; but it is only dug for in the provinces belonging to the Spaniards. There are two ways of obtaining the gold from the mine, which are either by breaking the rocks that contain it, with iron crows, or washing the sand which is conveyed by the currents of the rivers. The first method is preferable, because it is most advantageous, but it is very expensive; for, besides the fatigue experienced by the workmen, it requires several machines, and a particular kind of mill, to reduce to powder the metallic fragments.

The other manner of obtaining gold is generally adopted by those who have not sufficient property to establish the apparatus already mentioned; they therefore put the sand in a kind of horn bowl, which they call *porunna*, in which they wash it well, and collect the particles of gold that have subsided by their weight. But as they do not use mercury, they lose more than half of the valuable metal. The profit is, nevertheless, very considerable.

Some silver mines have also been discovered in this country; but as they require much greater fatigue and expence than the gold mines, they are little attended to. The following is the gross method which the inhabitants employ for separating this

metal from its heterogenous parts. They first reduce the ore to powder by means of a mill, then sift it through a very fine wire-sieve, mix it with mercury, salt, and mud, and inclose it in an ox-hide, when they pour water on it for some time; it then forms a mass, which during eight or ten days is malleated, and trodden under feet twice a day. After these operations the mass is put in a stone trough, where water is poured upon it, which carries off the ore into pits that are formed under the trough; and here the amalgama of silver and mercury is precipitated in whitish globules. These globes are then taken out, and put in a linen bag, which is squeezed hard, in order to express the mercury, after which the workmen give to the mass, which is as soft as dough, such forms as their caprice may dictate. But, as mercury, notwithstanding the pressure, has not entirely been forced from the silver, they throw the mass into a well-heated furnace, where the mercury is volatilized, and the silver remains pure, white, and solid.

The copper-mines in this country are as abundant as those of gold, with which, indeed, they are often mixed; but the people only work those that are very rich in ore. They adopt the following methods to obtain the copper:—At first they dig a deep ditch, which they pave with a mixture of plaister and calcined bones, which resists heat to such a degree, that there are no cracks in it through which the metal can escape. On each side of the ditch, which is square, are built four walls, which, at the surface of the ground, close in the form of an arch, and make a kind of an oven. A hole or door is left at the top by which to put in the metal, and observe the state of its fusion; some small apertures are also left to give vent to the smoke. The fire is then blown to a great heat by bellows, worked by water. The furnace is heated for several days before the metal is put in, and even then large logs of wood are added to it. At length, when the copper is in a complete state of fusion, a door is opened at the bottom of the furnace, from which it issues, like a torrent of fire, and fills the trenches that have been made for its reception.

Iron, though abundant in this country, is not explored.

Quadrupeds. The *guanaco, chilbuéque, guémul,* and the *Peruvian sheep,* are species of animals which very much resemble each other, and may be considered as belonging to the genus of the camel, from which they differ by not having the hump. The chilibuéque is an animal between the guanaco and the European sheep. Its head, neck, and tail, are like those of the guanaco, and the rest like the sheep, except that the animal is altogether about twice as big: hence the Indians call it chilibuéque, which means Chili sheep, in order to distinguish

it from the lama, or sheep of Peru, The chilibuéque is a domestic animal, which is held in much esteem by the Indians; and in their religious ceremonies and treaties of peace, they sacrifice it as a token of friendship. Its flesh is as good as that of common sheep, and its wool is excellent. This animal is of four colours, viz. white, grey, black, and ash colour; but it does not increase much, on account of the difficulty of conception on the part of the female, which is obliged to be kept up before she will receive the male.

The guémul is, in form and shape, like a chilibuéque, with the exception of its tail, which resembles that of a stag: it is wilder than the guanaco, and almost always herds on the steepest parts of the Andes.

The Peruvian sheep lives in the most temperate parts of the country, but particularly in the provinces of Copiapo and Coquimbo. It must necessarily be very prolific, for notwithstanding the continual massacre to which it is subjected, it is always to be found in great numbers.

The *viscaque* is of the size and almost the same figure as a large rabbit, except that its legs are shorter: its hair is soft, and of a grey and black colour, while its tail, which resembles that of a fox, is furnished with hair so hard and sharp that they seem like bristles.

There is another animal called *chinna*, which is also about the size of a rabbit, but in figure it resembles a little dog. This animal enters the houses in the country, eats whatever it finds, and roves about amongst the dogs, which do not disturb it any more than their masters; in fact, the people respect and fear it, though it does no harm, either with its teeth or its claws. The circumstance which places it in security is, that it has a little bladder at the root of the tail near the anus, which contains an excessively fœtid liquor, that it darts towards those who attack it; and the smell of it is so contagious that it renders a chamber uninhabitable for ever, if a drop happens to fall in it.

The *arda* is a species of field mouse, though of the size of a cat, and is only found in the province of Copiapo. This animal is tolerably docile, and is covered with a thick ash-coloured wool, as delicate as the finest cotton.

TOPOGRAPHY OF THE PROVINCES AND TOWNS.

COPIAPO. This corregidory, the principal town of which is *Saint Francois de la Selva*, borders on that of Atacama, in Peru, and to the north and west it is limited by the Pacific

Ocean. Its length is 180 miles from north to south; and its breadth between 60 and 90 miles from east to west. There is but little rain in this district, nevertheless it produces all sorts of corn and fruits of the finest quality. Its climate is always mild, and it contains many mines of copper, sulphur, loadstone, gold, silver, and lapis lazuli. There is a shrub which grows on the banks of the rivers in this country called *paraxabolo*, and which, when reduced by heat, answers the purpose of wax for sealing bottles. A quantity of large eels is caught on the coast, and the chief articles of exportation are nitre and sulphur, the latter of which is so good, that it requires no purification.

Coquimbo. This corregidory borders to the east, on that of Tucuman; to the south, on that of Quillota; and to the west, on the Pacific Ocean. It is 240 miles long, by 120 broad, from east to west. There are bred in it numbers of guanacos and Peruvian sheep; and its vegetable productions are wine, corn, and excellent oil. It contains many mines of gold, silver, copper, lead, mercury, lime, and salt; and those of copper supply Spain with the metal from which its artillery is cast. The country also affords excellent horses, and ox-hides, with which a considerable commerce is carried on at Lima.

The capital of Coquimbo, which is also called *Serena*, is three quarters of a mile from the sea, and its climate is that of a continual spring. All its streets are even, and its houses are ornamented with beautiful gardens and walks of myrtle trees. Its port is commodious and much frequented: it is 45 miles from the city of Conception, and 174 from Saint Jago, in 24 deg. 54 min. S. lat.

Cuyo. This is a great corregidory, the capital of which is Mendoza. In the eastern parts of Chili, it is called Trasmontano: it is bounded to the east by Pampas; to the north by Bioxa in Tucuman; on the south by the territories of the Puelch Indians and other savages; and on the west by the Andes. This province is extremely fertile, and besides abundance of fruits, it also affords much corn, wine and brandy. The wine is sent to Buenos Ayres and Monte-Video; its colour is like that of a mixture of rhubarb and senna, and its taste is similar to that composition; but it probably acquires both these qualities from the goat's skins, in which it is conveyed; and scarcely any other kind is drank in all Paraguay. It is a good stomachic. This country abounds in all sorts of cattle, besides Peruvian sheep, and the *Reha Americana*, or Magellanic ostriches. The flesh of the wild boar and the he-mule of these parts is excellent, and all other kinds of provision are uncommonly cheap. There are also silver, copper, and gold mines. The inhabitants are very adroit at hunting, and parti-

cularly in chasing ostriches, the exercise of which renders them so agile, that they can keep up with a horse at a gallop.

QUILLOTA. The capital from which this corregidory takes its name, is called *St. Martin de la Coucha.* It is situated about 27 miles from Valparayso, and is bounded to the north by Coquimbo. It is 75 miles from north to south, and 63 from east to west. It produces wine, corn, cattle, and abundant mines of gold and copper. The inhabitants are employed in making ropes for ships, as well as soda and soap, which are articles of commerce.

VALPARAYSO. The soil of this town is but ordinary in point of fertility, as it consists mostly of calcareous hillocks, which rise one above the other like the steps of a terrace. The vallies and plains between these rows of steep hills produce excellent fruits, particularly the Quillota apples.

Valparayso, which is a port, and a good town for trade, is 90 miles from Saint Jago, the capital of Chili. This central position renders it the principal medium of commerce for the whole viceroyalty. There are exported annually for Lima nearly 15,000 tons of wheat, either in grain or flour; and a considerable quantity of ropes, salt-fish, and fruits. The merchants of Valparayso receive in exchange sugar, tobacco, indigo, and spirituous liquors.

The houses of Valparayso only consist of ground floors, on account of the frequent earthquakes. Their walls are constructed of mud plastered with mortar, but they are convenient, appropriate to the climate, and in general well furnished. The batteries at the port are mounted with seventy pieces of cannon; but Captain Vancouver asserts, that three frigates would beat them to atoms.

ACONCAGUA. This corregidory, the capital of which is *St. Felipe el Réal,* borders to the north, on a part of that of Quillota; and to the south on the jurisdiction of Saint Jago. It produces a quantity of corn. Some barracks have been built on the mountains, through which a road leads to Mendoza, and these edifices serve as a shelter to travellers, who are supplied at them with biscuits and salt beef. In consequence of this regulation couriers pass to and from Saint Jago at all seasons of the year.

MELIPILLA. This jurisdiction, the chief place of which is *Logrono,* borders to the east on that of Saint Jago, and is limited to the west by the sea. It is not very extensive. Its prductions are corn, wine, and cattle; and an abundance of fish is caught on the coast.

BACANGUA. This is a corregidory, the chief place of which is *Santa-Cruz de Triana;* but it is sometimes called Bacangua.

It borders on that of St. Jago, and reaches as far as the sea. It is 120 miles from east to west, and 39 from north to south. It is well watered, abounds in fruit and fish, and contains some mines of gold and rock salt, as well as some medicinal baths, which are beneficial for various diseases.

SAINT JAGO, or more properly *San Yago*. This is a corregidory, which is 78 miles long from east to west, and 6 broad from north to south. It has many gold mines, but they are only worked in summer, which is in December, January, February, and March. About 60 miles from the capital is the great mine of *Kempu;* and in the valley called Blanche, they breed silk-worms. At the mountain of *Delcurato de Colina* there are thirty-four gold mines, at which people work every day; and the province also contains some mines of copper and tin, three of silver, and one of lead. At *Monte-Negro* there has lately been discovered a quarry of jasper. Vancouver asserts, that the soil, from Valparayso to Saint Jago, is a continual ascent, and that the cold from the mountains is sensibly felt. The climate of Saint Jago is temperate and salubrious; the environs of the town are covered with gardens and vineyards, while the eye extends farther over vast grazing plains, and the interesting perspective is terminated by the summits of the Andes, which are covered with snow.

SAINT JAGO, the capital of the whole kingdom of Chili, is situated in 38 deg. 40 min. 11 sec. S. lat. and is 90 miles from the port of Valparayso. The town is said to be more than three miles in circumference. The streets intersect each other at right angles, and some of them are tolerably wide, and three quarters of a mile long. Its population is estimated at 30,500 souls. Some of the edifices in Saint Jago are worthy of mention, on account of their magnificence, though the rules of architecture have not been exactly observed in their construction; the principal are, the mint, the new cathedral, and some churches, though there are several splendid houses belonging to individuals. These all consist only of a ground floor, though the apartments are capacious and lofty. This manner of building, which is, as has been observed, adopted from the fear of earthquakes, is probably in the end more convenient, salubrious, and even more magnificent than the European method of building several floors above each other.

Saint Jago is the residence of a captain-general, who is likewise the civil magistrate of the kingdom of Chili; of a bishop who enjoys a large revenue, and a still greater degree of respect, of a supreme tribunal, an university, and a college of nobles. There are twelve monasteries and seven nunneries in this capital.

The manner of living at Saint Jago exhibits all the characteristics of gaiety, hospitality, and good nature, which so advantageously distinguish the Spaniards in the New World as well as in Europe. The women there are handsome brunettes, but a gothic dress rather disfigures them. The conversation in the first circles of the towns seems to partake of the simplicity and freedom which prevail in the country parts of Europe. Dancing and music are here, as well as throughout America, the favourite amusements of both sexes. The luxury of dress and equipages is carried to a great height; but in the furnishing and fitting up the houses, more regard is had to pomp than to neatness and elegance.

COLCAGUA. This corregidory, the capital of which is *Fernando*, is bounded to the east by the Cordeliers or Andes; to the west by the South Sea; and to the south by the province of Maule. It is 120 miles from east to west, and 90 from north to south. It contains mines of gold and copper; and abounds in cattle, horses, and mules. Hot springs are frequently met with in this country, which are excellent for curing leprosy, wounds, and siphylitic diseases.

CHILLAN. This place, though a capital, is a very small and mean looking town: it lies in 36 deg. 6 min. S. lat. At a short distance from it there is a volcano, which bears the same name.

MAULE. This province, the capital of which is Talca, is bounded on the east by the Cordeliers, by the district of Conception, from which it is separated by the river Maule; and on the west by the south sea. It is 138 miles from north to south, and 90 from east to west. It contains many gold mines, but particularly that of Mount Chivato, which is very famous for the quantity of pure metal that it affords. The country furnishes all sorts of corn and cattle in abundance, but particularly goats, the skin of which is made into Morocco leather, and gives rise to a considerable commerce. A kind of wine, which is much valued, is also produced in this country, as is likewise tobacco. There is also a pitch mine, and a quantity of very white salt is manufactured in these parts.

CONCEPTION. This corregidory extends from the river Maule to that of Biobio, which is its limit, at the inhabited parts of Chili. Its climate is temperate, and the four seasons of the year are distinguished as in Europe, though at inverse periods. The soil is very fertile; the wheat yields in the proportion of sixty grains to one; the vines are equally abundant, and the fields are covered with cattle. In 1787, the price of a large ox was eight piastres; and that of a sheep three quarters of a piastre. The men are very robust, courageous, and adroit

at riding, as are the women: but they are particularly clever at throwing a running-noose over the different animals which they hunt, without ever missing their mark.

The town of La Conception having been overwhelmed by the sea, in consequence of an earthquake, a new one has been built at some distance from the shore, which is indiscriminately called La Mocha, or New Conception. The inhabitants are about 10,000 in number. It is the residence of an intendant and a military commander, and the authority of these two officers extends over the province of La Conception, which comprises the south of Chili; but its limits are not precisely known.

Talcaguana is a little town, situated at the shore of the bay of La Conception, which is one of the most convenient harbours on the coast of Chili. The fortresses of Araucos, Tucapel, and others, were intended as a check to the incursions of the Indians, who are now submissive and peaceable. Our account of this vast and interesting country will terminate with

VALDIVIA. This is a corregidory, the capital of which bears the same name. It is situated on the bank of a river, and of a fortified eminence. This is considered one of the best places in all America. It has a good and well-defended port; its fields are very fertile; it furnishes excellent timber for building, and contains a great number of gold mines.

ACCOUNT OF THE VICEROYALTY OF PERU.

THE viceroyalty of Peru comprehends the audiency of Lima, the province of La Paz, and the presidency of San-Yago. This presidency is, however, separated from the other parts of the viceroyalty, as has already been shewn, by the audiency of Charcas, which belongs to the viceroyalty of Buenos Ayres.—The two former occupy the principal part of the ancient Peru.

This great empire, the foundation of which by the Incas remains enveloped in the obscurity of a series of fables, and of an uncertain tradition, has lost much of its local grandeur since the time when it was stripped, on the north side, of the provinces which form the kingdom of Quito, and afterwards of those which, towards the east, constitute the viceroyalty of Buenos Ayres. Its present extent in length runs, north and south, over a space of from 1200 to 1350 miles, from two degrees to nearly twenty-three degrees of south latitude; and its greatest breadth is from 300 to 360 miles, east and west,

i. e. about 15 degrees of W. lon. The river of Guayaquil divides it from the new kingdom of Granada on the north side. The depopulated territory of Atacama separates it from the kingdom of Chili towards the south. Another horrible desert, of more than fifteen hundred miles extent, separates it towards the east from the provinces of Paraguay and Buenos Ayres; and lastly, the Pacific Ocean washes its western shores.

A chain of barren and rugged mountains; several sandy plains, which in a manner reach from one extent of the coast to the other; and several lakes of many leagues in extent, some of which are situated on the summits of the above chain of mountains, occupy a great part of the Peruvian territory. Throughout, the breaks and the vallies, which enjoy the benefit of irrigation, present to the view an extensive range of delightful plains, replete with villages and towns, and the climate of which is highly salubrious. That of the elevated spots of La Sierra is extremely cold. In the pampas, or plains, of Bombou, Fahrenheit's thermometer is constantly at from thirty-four to forty degrees above zero.

The population of Peru does not much exceed a million of souls, and so far as relates to the original casts, is composed of Spaniards, Indians, and Negroes. The secondary species best known, and proceeding from a mixture of these three, are the mulatto, the offspring of the Spaniard and negro woman; the quarteron, of the mulatto woman and Spaniard; and the mestizo, of the Spaniard and Indian woman. The final subdivisions which are formed by the successive mixtures, are as many as the different possible combinations of these primitive races.

The commerce of Peru has been considerably augmented, since it has, by the arrival of the merchant vessels of Spain by Cape Horn, and by the grant of an unrestrained commerce, freed itself from the oppression under which it groaned in the time of the galeons, and of the fairs of Porto-Bello and Panama. Prior to that epoch, the bulky and overgrown capitals circulated through, and were in a manner lost in, a few hands; and while the little trader tyrannised over the people, by regulating, at his own will, the prices of the various productions and commodities, he himself received the law from the monopolising wholesale dealer. The negociations of the capital with the interior were then, in a great measure, dependant on the intelligence and the decisions of the magistrates; and the commerce with Spain owed its best security to the circulation of the silver entered in the bills of lading. Commerce, on the other hand, being at this time subdivided into so many smaller branches,

maintains a greater number of merchants; at the same time that the fortunes which accrue from it are not so numerous. It is necessary that a commercial man should combine his plans skilfully, and extend his speculations, to be enabled to acquire a handsome property.

The manufactures of this country consist almost entirely of a few friezes, the use of which is in a manner confined to the Indians and negroes. There are besides an inconsiderable number of manufactures of hats, cotton cloths, drinking glasses, &c. which do not, however, occupy much space in the scale of the riches of Peru. Sugar, Vicuna wool, cotton, Peruvian bark, copper, and cocoa (it is to be observed, however, that the two latter articles, as well as a considerable part of the Peruvian bark, are sent hither from Guayaquil, &c.), are the only commodities, the produce of our mines excepted, which we export.

The mines are the principal, it may indeed be said, the only source of the riches of Peru. Notwithstanding the little industry which is employed in working them, and the small help which commerce affords to the miners, 534,000 marks of silver, and 6,380 of gold, were smelted and refined last year (1790) in the royal mint of Lima; and 5,206,906 piastres, in both materials, were coined there.

From the mines of Gualgayoc, and from that of Pasco, about the one half of the silver which is annually smelted, coined, and wrought, is extracted. The mine of Guantajaya is abundant in ores and rich metallic veins, but does not yield in proportion, in consequence of the dearness of every necessary, as well for working as for convenience and subsistence. On account also of its distance fom the capital, the benefits which would otherwise arise from it are lost; the ores of thirty marks the caxon*, do not pay themselves; and the same may be said of the products of the smaller and more superficial veins, which occasionally present themselves, and in which the silver is chiselled out.

Lima. The audience of Lima is divided into five provinces or districts, viz. Truxillo, Guamanga, Lima, Cusco, Arequipa, and we may add the province of La Paz.

The province of Lima extends along the coast of the Pacific Ocean, and is subject to the jurisdiction of the viceroy and archbishop of Lima. It is subdivided into several subordinate districts, among which the principal is *Conchucos*. This district is 156 miles in length, by 60 in breadth. It abounds in fruits of various kinds, and also produces luxuriant crops of

* The caxon contains 6,250 pounds.

wheat, maize, and barley; but the chief wealth of the inhabitants consists in the possession of numerous flocks, of which the wool constitutes the chief article of their commerce. There are also some mines of very pure gold and silver, as well as of sulphur, in different parts of Conchucos.

Santar, another of these subordinate divisions, is bounded on the north by Truxillo, and on the west by the South Sea. It is 120 miles in length, and 36 in breadth. Along this part of the coast there are different safe and commodious harbours; the chief commerce of Santa consists of wool-bearing animals, cotton, and hogs-lard, for which the merchants find a ready market at Lima; there are some sugar-houses and distilleries established in the capital. The climate in this district is rather warm; it abounds with mines containing loadstones.

Caxatamba, the third subdivision, is 102 miles long, and 96 broad; like Santa, it abounds in fruit of every kind; but the chief dependance of the inhabitants is upon their flocks and herds. Their trade is mostly confined to woollen stuffs, some of which are dyed with the cochineal found in the neighbourhood. In this district, there are several mines of alum, copperas, and silver.

Guanuco, the forth of these subdivisions, is blessed with a mild and salubrious climate and a fertile soil. Here cotton is raised in great abundance, and at the foot of the mountains vast quanties of cocoa, which is sold at Tarma. This district is intersected by two large rivers, which from a junction near the capital, bearing the same name as the district: the preserves made here are much esteemed at Lima.

The district of Tarma is bounded on the north by Guanuco. Here the climate is colder than in any other part of the province of Lima; of the wool procured from their numerous flocks, the inhabitants manufacture stuffs of different qualities, which constitute the principal staple of their commerce. There are also some productive silver mines in this district. Government has found it necessary to constitute forts at different points, in order to prevent the incursions of the Indians from the mountains. Chancay, or Annedo, which is the last of these subdivisions, enjoys a considerable diversity of climate, being warm towards the sea, and colder on the side adjoining the mountains. The inhabitants of this district cultivate maize in great abundance, with which they fatten hogs and pigeons in vast numbers for the market of Lima, and which produces to them more than 300,000 piastres (53,750 pounds sterling). In this district the land is manured with the dung of a bird, termed huanaco, which inhabits the small islands near the coast, and such is the fertility it gives to the soil, that if a handful of maize be scattered at

random it will produce a two hundredth fold. This country likewise abounds with salt-pits, from which the adjoining provinces are furnished with this necessary article; it is given to their animals as an antidote against an insect which attacks their livers, so as most frequently to occasion their death.

In a greater or less degree, the arid mountains of Peru may be considered as an inexhaustible elaboratory of gold and silver. With the exception of the mine of Guantajaya, situated near the port of Iquique, at a distance of two leagues from the sea, the richest mines are comprehended in the most rigid and insalubrious parts of *La Sierra*, where the absence of plants and shrubs, or, in other words, the infertility itself of the cold soil they occupy, is in general a sure indication which leads to their discovery.

As the Indians were ignorant, not only of the invention of money, but likewise of the astonishing powers of hydraulics applied to machinery, and of the secrets of mineralogy, more especially as they refer to chemistry and subterraneous geometry, the metals they extracted were not of a very considerable amount. The last emperor of Peru could not muster for his ransom, the value of a million and a half of piastres in gold and silver; and the plunder of Cusco was not estimated at a greater sum than ten millions. This was a small quantity for so many years of research and accumulation, but immense for the simple and unique process of collecting, among the sands of the rivers, the minute particles of gold that had been swept along by the waters, and the little pure silver that could be dug out of a pit, which, in many instances, did not exceed a fathom in depth.

The most moderate computations of the Spanish writers, among whom may be particularly cited Moncada, Navarrete, and Ustariz, fix at nine thousand millions of piastres the sums which Spain received from America during the two hundred and forty-eight years that followed its conquest up to that of 1746. The mine of Potosi alone, during the first ninety years of its being worked, produced 395,619,000 piastres;—a prodigious extraction, which appears more surprising, when it is considered that metallurgy had hitherto been treated, not according to the principles and rules of art, but according to the adoption and practice of an ancient and blind usage.

As the provinces of La Sierra annexed to Buenos Ayres are the most abundant in mines, and on that account the most populous and steril, it is necessary that the consumers, whose numbers are very considerable, should be supplied with the natural productions of the coast, the only part of the territory of Peru where the lands can be profitably cultivated. Ape-

quina is, by its proximity, the source of these supplies; and Cusco administers, by its manufactories, the baizes, and other articles of clothing which the population demands. It ought, however, to be observed, that the augmented introduction of the manufactures of Europe, by the river of La Plata, has latterly occasioned this branch of commerce to decline in a sensible manner; the camlets, fustians, second cloths, &c. imported by this channel, having been sold at little more than their prime cost, so as to have ruined, by their competition, the baizes and stuffs of the manufacture of the country.

Lima, which is the capital of the kingdom of Peru, is justly regarded as one of the handsomest, largest, most populous, and richest cities in the world. It is termed by the Spaniards the *Queen of Cities*, though a commercial spirit does not prevail in it to the same extent as in Mexico and Buenos Ayres; nor are the inhabitants equally industrious as those of Puebla, of Los Angelos, or Quito. M. Humboldt highly extols the genius, the liberal sentiments, and natural gaiety of the inhabitants.

This city is situated nearly six miles from the Pacific Ocean, between the 78th and 79th deg. of W. lon. and 12 deg. 2 min. 31 sec. S. lat. The port called *Callao*, is six miles distance from the city, in a plain termed the valley of Rima, or sometimes the valley of Lima. This valley is intersected by a river of the same name, over which is thrown a beautiful stone bridge consisting of five arches. The city is of a triangular figure, surrounded with brick walls, having 34 bastions; it is more than two miles in length on the side next the river. The streets are wide, and most of them run in a straight direction. The houses are low, on account of the frequency of earthquakes, but are highly ornamented, and of an elegant appearance; they have generally gardens adjoining to them. The royal square is extremely handsome, and in the middle is placed a beautiful fountain of bronze, surmounted by an image of Fame, executed in a very good style. This square is from 500 to 600 feet in length, and is surrounded by superb edifices.

There is one university in Lima, dedicated to St. Mark; this city is the residence of a viceroy, who is persident of the royal audience; besides an ecclesiastical tribunal, there is also a supreme tribunal of audience, composed of a president, a fiscal, and two examiners. The climate is here healthy and extremely agreeable, and though no rain falls, the ground is watered by a gentle dew termed *garua*; a variety of the most delicious fruits abound in the vicinity of Lima; and, in short, nothing is here wanting which can contribute to the comfort or the luxury of the inhabitants.

A treasury is established here for receiving the duty on the produce of the mines, as well as all the taxes paid by the Indians to the king of Spain.

The trade carried on by the marchants of Lima, is represented by Alcedo to be very extensive; but this author appears to have overlooked the great decay of this trade, occasioned by the growing prosperity of Buenos Ayres, which is much more conveniently situated for the European commerce. Besides, the government has established at this last place, a magazine for the produce of the mines of Potosi and La Plata; these are now conveyed thither by the Pilcomayo, and the river La Plata, which is a much shorter, and more secure route, than that of Lima.

The beauty of the situation, the fertility of the soil, the mildness of the climate, and the riches of the inhabitants of Lima, are not, however, sufficient to compensate for the continual dangers with which they are menaced. In 1747, a dreadful earthquake destroyed three fourths of the city, and entirely demolished the port of Callao. Never was destruction more complete, since of 30,000 inhabitants, only one escaped to relate the disastrous event. This man happened at the time to be in a fort which overlooked the harbour, when he perceived all the inhabitants, at the same moment, rush out of their houses, in the greatest terror and consternation. The sea, as is common on similar occasions, receded to a great distance from the shore, but almost immediately returned like foaming mountains, and engulphed these unfortunate people. The next moment all became calm and tranquil, but the waves which had destroyed the city, drove a small boat into the place where this man had remained, into which he threw himself and by this means attained a place of safety.

QUITO.

The province of Quito is perhaps one of the most singular and interesting countries in the universe. The valley of Quito is situated 1460 toises obove the level of the sea, which is higher than the tops of the most elevated mountains of the Pyrennees. A double range of mountains surround this delightful valley; though under the equator, an eternal spring reigns in this favoured spot; the trees are perpetually clothed with luxuriant foliage, and loaded with fruits of every species; it abounds with animals, the wool of which is employed in the manufacture of stuffs, which form its principal article of commerce with Peru. They likewise manufacture in this city cotton cloth equal in fineness to that which they receive from England. The pro-

vince every where abounds with mines of gold, silver, copper, and other metals; there are also several mines of quicksilver, rubies, amethysts, emeralds, rock crystal, and of beautiful marble of different qualities.

This kingdom is intersected in all directions by innumerable rivers, of which the principal flow into that of the Amazon, while others pour their waters into the Pacific Ocean; amongst these we remark the river of *Emeraldas,* the banks of which formerly abounded with emeralds, the precious stone from which its name is derived.

But this fertile and smiling country is not the abode of safety and tranquillity. " Unfortunate people," says the eloquent Marmontel, when speaking of the inhabitants of Quito, " unfortunate people! whom the fertility of this deceitful land has drawn together; its flowers, its fruits, and its luxuriant harvests, cover an abyss underneath their feet. The fecundity of the soil is produced by the exhalations of a devouring fire; its increasing fertility forebodes its ruin, and it is in the very bosom of abundance that we behold engulphed its thoughtless and happy possessors."

The earthquake of the 7th February, 1797, has been justly reckoned one of the most destructive that ever occurred on our globe. A particular description of this event, as well as of the volcanoes of Pichincha and Cotopax, will be found in a subsequent page of the Appendix.

The labouring classes of the inhabitants of the city of Quito are industrious, and have attained to considerable perfection in many arts and manufactures, particularly in those of woollen and cotton cloths, which they dye blue, and dispose of in the different villages and cities of Peru. The number of the inhabitants of this city is estimated at 50,000, of which the majority are mestizes, the offspring of native Indians and Spaniards. It is governed by a president, and in it is held the supreme court of justice: it is likewise a bishop's see. The inequalities of the ground on which it stands are so great, as to render the use of carriages inadmissible. The houses are constructed of brick, and seldom exceed two stories in height.

MISCELLANEOUS FACTS.

NATURAL CURIOSITIES OF SOUTH AMERICA.

AMONG the natural curiosities in South America may be mentioned those immense quantities of fossile bones, found in the vicinity of Santa-Fé, at 2,370 toises above the level of the sea; some of which evidently belong to the species of elephant known in Africa while, others appear similar to those discovered near the banks of the Ohio. M. Humboldt speakes of having seen similar bones, which were discovered in the Andes and in Chili; from which fact it may be fairly inferred, that those gigantic animals must have formerly existed from the shores of the Ohio to Patagonia.

From the researches of M. Humboldt it appears, that petrifactions are extremely rare in the Andes; even belemnites and ammonites, so common in Europe, are there wholly unknown. Along the shores of Carraccas, this indefatigable naturalist found many shells recently petrified, and resembling those in the neighbouring sea. In the plains of the Oroonoko some trees have also been found petrified, and converted into a hard stony substance.

Father Feuillée, describing in his journal the warm springs of Guancavelica observes, that the inhabitants of this canton set apart those waters which are strongly impregnated with calcareous particles, to cool, when they deposit a sediment, which, being received into vessels prepared for the purpose, soon acquires the hardness of stone; and that it is with this stone their houses are constructed.

But the greatest natural curiosity perhaps in South America, is the skeleton of a quadruped discovered under ground in Paraguay. The form of the head, and the proportions of the body, bear some affinity to those of the sloth, but its length is twelve feet, from which, and other circumstances, it should seem to belong to a gigantic species which is probably now extinct. An accurate description of the *Megatherium* is given by M. Cuvier in the Annals of the Museum of Natural History, hom which it appears, that it is only furnished with molares, but is destitute of incisive or canine teeth.

ON THE MOUNTAINS.

NEXT to the extent of the New World, (observes Dr. Robinson) the grandeur of the objects which it presents to view, is most apt to strike the eye of an observer. Nature seems to have carried on her operations upon a larger scale, and with a bolder hand, and to have distinguished the features of this country with a peculiar magnificence.

The mountains of South America, which may be divided into three kinds, are much superior in height to those of the other divisions of the globe.

The great chain of the Andes runs through the whole continent, from north to south; it arises near the Straits of Magellan, and, following the direction of the Pacific Ocean, crosses the kingdoms of Chili and Peru, seldom receding more than 36 miles from the coast. The broadest part of this chain is in the vicinity of Potosi and lake Titicaca; near Quito, under the equator, the continuation of this range rises to a prodigious altitude, forming the highest mountains on the surface of the globe. At Popayan, it terminates and divides into several branches, two of which, in particular, are very remarkable; the one runs to the Isthmus of Darien, the other passes between the Oroonoko and the river Madelaine, and approaching the Caribbean Sea, to the east of the lake Maracaybo, it pursues the direction of the coast, and appears to stretch, under the sea, as far as the island of Trinidad.

Under the second division of mountains in South America, are comprehended those of Brazil, which form rather a cluster than one continued chain. The centre of this cluster appears near Minas-Geracs; from this point there proceeds one chain towards the north, which terminates at Cape Royne; another pursues a southern direction along the coast from Rio Janeiro to Rio St. Pedro; lastly, a third chain, that of Matogropo, extends towards the Compos-Paresis, a large reservoir of water, which, during the rainy season, empties itself into the Amazon and La Plata.

The third division of mountains is composed of those which arise near lake Parima, and form the centre of Guiana. This central point has not hitherto been sufficiently explored; very little also is known of the chain which appears to stretch eastward towards Cape North; but some important information has been furnished us by Don Santos, Don Solano, and M. de Humboldt, respecting the chain which extends towards the Oroonoko. This series, according to them, is extensive, but not very elevated. To the south-west it is lost in an extensive

plain, where the waters of the Oroonoko and those of the Amazon form communications, particularly with a branch of the river Casiquiari. This circumstance alone may serve to show, that there does not exist one uninterrupted chain to the Andes, as some might be led to infer from one of the letters of Humboldt on this subject. There can, in fact, only be an abrupt descent from one plain to another; in which way are formed, it should seem, the cataracts of the Oroonoko.

Thus, it is evident, that the three extensive plains, viz. that through which the Oroonoko flows, that which the Amazon crosses, and that which is watered by La Plata, are in contact with each other. Hence it would not be a difficult undertaking to establish a communication, by means of navigable canals, from the mouth of the Oroonoko to Buenos Ayres.

To the general view of the configuration of the American mountains, may be added some details, which we owe to the indefatigable labours of several distinguished travellers, particularly Condamine, Bouguer, and Humboldt.

In the mountainous chain which borders the northern coast of Terra Firma, is situated the lake of Valencia, which particularly attracted the attention of M. Humboldt, by whom we are informed that it exhibits a similar appearance to the celebrated lake of Geneva, with this difference, that it is embellished with all the luxuriance of vegetation peculiar to the torrid zone. The height of this range is estimated at from six hundred to eight hundred toises above the level of the sea. The plains, which extend to its base, are from 100 to 260 toises. But there are detached mountains, which rise to a prodigious height; for example, the altitude of *Sierra Nevada* of Merida is 2,350, and that of the *Silla* of Carraccas 2,316 toises. Their summits are covered with perpetual snows, and from them proceed torrents of hot liquefied substances, sometimes attended with earthquakes. This chain is more precipitous towards the north than to the south; in the *Silla* there is a dreadful precipice, upwards of 1,300 toises in height.

The rocks of this chain are composed of *gneip* and *micaceous schistus*, as in the inferior division of the Andes; these substances are frequently disposed in strata from two to three feet in thickness, and contain large crystals of feldspath; in the micaceous schistus are often contained red garnets, as well as other matters; and in the gneip of the mountain D'Avila, green garnets are not unfrequently found, and sometimes also noduels of granite. Towards the south the chain is partly composed of calcareous mountains, which sometimes rise to a greater height than the primitive mountains. In this range we also meet with rocks of veined serpentine bluish steatites, &c.

The chain of Guiana, or the mountains towards Lake Parima, do not rise to the same elevation as the former. According to the estimate of M. Humboldt, the mountain of Duida, near the Emeralds, is 1323 toises in height. This majestic mountain, from which are constantly ejected flames towards the end of the rainy season, surmounts an extensive plain, covered with palm-trees and ananas. It is wholly composed of gneiss, micaceous schistus, slate, and amphibole. Throughout this chain, granite appears predominant. The rocks reputed primitive and secondary, are here arranged in a very singular order. The masses of talc, or shining mica, with which the chain of Parima abounds, have given rise to the fabulous tradition of El Dorado, or a country of gold.

On the road to Los Llanos, leading to the Andes of Peru, lie immense deserts, similar to those of Africa; where, in consequence of the reflection of the heat from the sand, Reaumur's thermometer usually ascends to 33, or sometimes even to 37 deg. in the shade. Throughout an extent of more than 6,000 square miles, scarcely a single inequality on the surface of the ground can be perceived. Being wholly destitute of vegetation, during the dry season this sandy plain exhibits the appearance of a vast ocean, and affords only a shelter to crocodiles and serpents of different kinds. The traveller, in pursuing his way through this dreary region, has no other guide than the course of the stars, and the trunks of a few decayed trees.

It was through these deserts that M. Humboldt and Bonpland pursued their journey to the upper Oroonoko; but on their way to Quito they went by St. Martha, and ascended the magnificent river of Madelaine, passing by the city of Santa Fé of Bogota, which stands 1360 toises above the level of the sea. From this part of the country, which M. Humboldt describes as a perfect desert, they proceeded to Popayan by the way of Buga, and crossing the delightful valley of Cauca, they visited the mines of Platina, in the mountain of Chaca.

This indefatigable naturalist likewise visited the basaltic mountains of Julusinto, and the craters of the volcano of Purace, which, at that time, ejected, with a dreadful noise, volumes of hydro-sulphureous vapours. The temperature of the vallies lying at the foot of this mountain is said to be extremely mild and delightful; the range of Reaumer's thermometer being from 17 to 19 deg. This neighbourhood abounds with beautiful porphyry granites, which are generally found in the form of small columns. In the province of Pasto, which comprehends the environs of Guachucal of Tugueres, lies an immense frozen and barren plain, almost surrounded with volcanoes, which conti

nually throw out clouds of smoke so as to darken the surrounding atmosphere. The unfortunate inhabitants of these deserts have no other food than a species of potatoes, termed by them *patates*. In 1800 the total failure of this their only crop reduced them to such a state of wretchedness, as forced them to ascend the mountains, and to devour the trunks of a small tree or shrub, named *achapella;* but as the bears of the Andes feed upon this small tree, the victims of famine were frequently even deprived by these animals of the only resource they had left to prolong their miserable existence. Near the small Indian village of Voisaco, situate 1370 toises above the level of the sea, is found, in great abundance, a red porphyry, with an argillaceous base, inclosing vitreous and corneous feldspath, which possesses all the properties of the serpentine of Montichtel, in Franconia.

M. Humboldt, who visited the city of Quito in 1802, describes the effects produced in its vicinity by the dreadful earthquake which occurred in 1797. "Quito," says this traveller, "is a handsome city, but the atmosphere is always cloudy; the neighbouring mountains are only covered with a scanty verdure, and the cold is very considerable. The tremendous earthquake of February, 1797, which desolated the whole province, and swallowed up from 35 to 40,000 individuals, was also fatal to the inhabitants of this capital. Such was the change produced by it on the temperature of the air, that Reaumur's thermometer, which at present fluctuates from 4 to 10 deg. and rarely ascends to 16 or 17 deg. constantly stood, previous to that catastrophe, at 15 or 16 deg. Since this period, likewise, the province under consideration has been constantly subject to more or less violent shocks; and it is not improbable that all the elevated part of it forms a single volcano. The mountains of Cotopaxi and Pichincha are only small summits, of which the craters form the different funnels, all terminating in the same cavity. The earthquake of 1797 unfortunately affords but too convincing a proof of the justness of this hypothesis, since during that dreadful occurrence, the earth opened in all directions, and ejected sulphur, water, &c. Notwithstanding the recollection of this afflicting event, and the probability of a recurrence of similar dangers, the inhabitants of Quito are said to be gay, lively, and amiable; their city is the abode of luxury and voluptuousness, and in no other place can there be displayed a more decided taste for amusements of every description."

During his stay in Quito, M. Humboldt also visited the crater of Pinchincha, which had formerly been examined by Condamine. From the sides of this crater rise three pyramidal rocks, from which the snow has been melted by the heat of the vapours continually issuing from the mouth of the volcanoes. In order

to examine more accurately the bottom of the crater, M. Humboldt assumed a prone posture: and it is impossible, he observes, for imagination to conceive a more dismal and terrifying picture than presented itself to his view. The mouth of the volcano formed a circular opening nearly three miles in circumference, of which the rugged and perpendicular sides were covered with snow towards the top: the interior was of a deep black, and so immense was this gulph, that he could distinguish the summits of several mountains contained within it. Their tops seemed to be two or three hundred toises beneath the point where he stood; hence we may judge at what depth their base must be placed. M. Humboldt is of opinion that the bottom of this crater is on a level with the city of Quito.

M. la Condamine, during his stay in America, ascended the volcanic mountain of Antisanna to the height of 2470 toises, which point M. Humboldt was not able to pass; but in the month of June 1802, he succeeded in ascending as high up the Chimboraco as 3031 toises. In both cases such was the rarity of the air that the blood gushed from his nose, mouth, and ears. During his short stay upon the latter mountain he was enveloped in a thick mist, which sometimes dispersed for a moment, so as to display to him the frightful abyss beneath his feet. No animated creature, not even the condor, which in Antisanna hovered continually over his head, appeared in this alpine region to diversify the dreary scene. From a trigonometrical measurement, taken by M. Humboldt, at two different times, the height of the *Chimboraco* is 3267 toises. This colossal mountain, like all the other high mountains of the Andes, is not composed of granite, but of porphyry, from the base to the summit; and the porphyry is 1900 toises in thickness. According to Bonguer, the line beyond which lies perpetual snow, is 2440 toises above the level of the sea. Humboldt has not, so far as we know, given any opinion on this point. The volcano of *Cotopaxi*, situated to the south-east of Quito, must be at least 18,600 feet in height. The *Descabesado* is likewise very elevated: but the Andes rest on a very high base, so that estimated separately, they do not equal the Alps in height; but when measured from the level of the sea, their elevation is infinitely greater.

The Andes of Chili appear to be equal in point of altitude to those of Peru: their nature, however, is less known, though from all the information we have been able to collect on this subject, volcanoes seem to be equally numerous in this as in the former chain of mountains.

MINERALS.

All travellers agree respecting the mineralogical riches of South America; many of the provinces of which abound in

extensive mines of native gold. In this country the silver mines are, however, still more numerous and more productive than those of gold, and being more easily wrought, have chiefly engaged the attention of the colonists. But it would be here superfluous to enter into any details respecting a subject so fully and ably treated on in the preceding part of this work.

Mercury, platina, copper, lead, and various other minerals, as will be seen from the account of M. Helms, are likewise common to various parts of South America.

During the reign of the Incas, among other precious stones, emeralds are said to have abounded on the coast of Manta, and in the government of Atacama; and it is affirmed that some valuable mines of this precious stone are still known to the Indians of these parts, but which they conceal, through the dread of being compelled to work them.

The emeralds found at this day in the sepulchres, are fashioned into circular, cylindrical, conical, and other forms, and are perforated with great nicety; but what methods were employed by the natives for this purpose, remain unknown.

TEMPERATURE AND VEGETABLE PRODUCTIONS.

Climate, it is well known, does not wholly depend on the degree of latitude in which any place is situated, but on various other causes, such as the greater or less elevation of the ground, the nature of the soil, the proximity of seas and rivers, and the scarcity and abundance of forests, &c. Thus it is that we meet with different zones and climates in the chain of the Andes, so that while winter prevails in the vallies, summer reigns in the more elevated regions. Thus also the rainy and the dry season occur at different times, in different places, separated only from each other by a few leagues. In general the countries towards the east of the Andes, are subject to violent rains, while on the contrary those to the west, being sheltered by high mountains, which impede the progress of the clouds, enjoy a dry atmosphere, the serenity of which is never disturbed by violent rains, tempests, nor thunder-storms.

From the relation of different travellers it appears, that in the vicinity of the coast are produced many of the fruits and vegetables peculiar to tropical climates, such as the cabbage palm, the cocoa tree, the cotton tree, the pine-apple, ginger, turmeric, the banana, the sugar-cane, &c.; while in the interior and more temperate regions, and on the borders of the Andes, plants and vegetables of a more hardy nature grow and flourish.

A country, indeed, of such vast extent as South America, lying on each side of the equator, and possessing a variety of

soils as well as climates, must necessarily contain many thousand specimens of plants and vegetables, which are either wholly unknown to us, or with which we are as yet very imperfectly acquainted. Hence the number of new species and genera which M. Humboldt, and his able coadjutor, have recently discovered, will not appear surprising when we consider that they traversed the interior of America, from Carraccas to the frontiers of Brazil, a great portion of which had never before been explored by any botanist.

Besides many other curious plants, they discovered a new genus of the family of palms, to which they have given the name *Ceroxylon*, from its singular property of affording wax. This plant is only found on the mountains of Quindiu, situated in 4° 35′ N. lat. These mountains, we are informed, consist of granite and micaceous schistus. Tropical plants in general do not vegetate at a greater height than 500 toises above the level of the sea; it is singular, therefore, that the wax-palm is never found below 900, and that it grows in great profusion at 1450 toises, where the mean temperature is from 66 to 68 of Fahr. It sometimes also springs up and thrives in regions 1000 toises higher, and in a temperature 30 deg. below that in which any other of the same tribe or family are to be found.

The wax-palm rises to the prodigious height of 180 feet, and its leaves are twenty feet in length. Another remarkable circumstance in the economy of this tree is, the secreted matter with which its trunk is covered, to the thickness of nearly two inches. This substance, according to the analysis of Vauguelin, consists of two-thirds of rosin, and one of wax. Being extremely inflammable, it is employed by the natives in conjunction with one third of tallow, in the manufacture of candles.

The *cardana alludora* is another large tree, which would appear to be well calculated for ship-building and similar purposes; it is chiefly remarkable for the strong smell of garlic which exhales from the leaves, and even the wood when green. A species of wild coffee, *coffea racemosa*, grows on the woody mountains in the interior; its berries are employed in the same manner as those of the cultivated species. Various kinds of pepper abound in these countries; M. Humboldt enumerates not fewer than twenty-four species, and five or six of capsicum, which are held in great estimation by the natives of Peru.

Tobacco and julap are also, we are informed, very common, especially the small woods at the foot of the Andes, as well as a variety of beautiful flowers and shrubs indigenous to the country, and many of which, such as *calceolaria, salvia longifloria*, &c. &c. embellish the gardens and green-houses in Europe.

The banks of the Oroonoko are covered with almost impe-

netrable forests, particularly of the *hevea*, *lecythis*, and the *laurus cinnamoides*.

The forests of Turbaco, near St. Martha, where M. Humboldt passed a few weeks, are ornamented with the *Tolnifera*, *Anacardium*, and the *Cavanillesca* of the Peruvian botanists. In ascending the river Madelaine, he observed, among a profusion of other rare and beautiful plants, the *dychotria emetica*, of which the roots are employed as a substitute for ipecacuanha by the inhabitants of Carthagena. M. Bonpland, during an excursion which he made to the forests in the neighbourhood of Jaen, likewise found a profusion of valuable plants, among which may be mentioned a species of the *Jacquinia*, and one of the *Cinchona*. This last, which is accurately described by Bonpland, he ascertained to be the very cinchona delineated by Condamine; it is characterized by the pits or holes at the roots of the large nerves of the leaves. Our limits do not, however, permit us to enumerate more particularly the valuable botanical discoveries made by these indefatigable naturalists, in the course of their travels through South America; suffice it here to observe, that every region which they explored, was found by them to abound with a profusion of new and rare vegetables.

The Editor has been favoured by an eminent Notary Public with a correct Statement of the MONIES OF ACCOUNT *made use of in Spanish America.*

IN all the Spanish dominions of North and South America, accounts are kept in *pesos* of 8 *reales*, subdivided into sixteen parts, and also into 34 *Maravedis de Plata Mexicanos*.

COINS.

OF GOLD. *Doubloons* of 8 *escudos de oro*, with halves and quarters in the same proportion.

OF SILVER. *Dollars, or pesos-mexicanos*, of 8 *reales*, with halves, quarters, eighths (or reales), and sixteenths, in the same proportion.

The value of the above coins depends on the current price of gold and silver. When the gold is at 3l. 17s. 10½d. per oz. (the Mint price), the new doubloon is worth 3l. 6s. nearly; and when silver is at 5s. 2d. per oz. (the Mint price), the dollar is worth 4s. 5½d. nearly.

From this proportion the value of the above coins may be calculated at any other price. Thus if gold be sold for 4l. per oz., say,

As, 3l. 17s. 10½d : 3l. 6s. : : 4l. : 3l. 7s. 9½d. = the value of the doubloon.

And if silver be at 5s. 4d. per oz. say,

As, 5s. 2d. : 4s. 4½d. : : 5s. 4d. : 4s. 7½d. = the value of the dollar.

N. B. *The Weights and Measures of Spanish America are the same as those of Old Spain.*

END OF HELMS'S TRAVELS.